NORTH MERRI
OPEN SPACE LANDSCAPE MASTER PLAN

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WARRNAMBOOL CITY COUNCIL

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Michael Smith and Associates and Practical Ecology value the opportunity to collaborate with the Eastern Maar Aboriginal Corporation on this significant environmental and community Master Plan project. We acknowledge the Eastern Maar People as the Traditional Owners of south-western Victoria and their continuing relationship to the country in which this Master Plan project is based, as well as their significant contribution to the Warrnambool community.

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1	02.05.2025	MSA and Practical Ecology	Draft Report
2	20.05.2025	MSA and Practical Ecology	Draft Report
3	11.06.2025	MSA and Practical Ecology	Final Report
4	17.06.2025	MSA and Practical Ecology	Final Report Rev A

EXECUTIVE SUMMARY

The North Merri Open Space Master Plan provides recommendations for the most appropriate landscape design outcomes on the flood plain located north of the Merri River, bounded by Wollaston Road, Waldock Way, the Merri River, and extending between Ponting Drive in the east to Caramut Road and Cassady's Bridge in the west.

The landscape design outcomes have been guided by the South Merri Open Space Precinct Plan and the Merri River Landscape Guidelines, with consideration of the local context, including neighbouring residential subdivisions, the Merri River School and connections to key community assets and zones, including the South Merri Open Space. The landscape design outcomes aim to improve the local habitat, conservation and cultural values of the North Merri Open Space, whilst providing passive recreation opportunities and connectivity to the local community.

The key recommendations for the North Merri Open Space Precinct are:

- Future connectivity and links. Two pedestrian and cyclist bridges and a future connection at Bromfield Street, are planned to connect the north and south side of the Merri River.
- Preservation of the existing view corridors along and across the river where views of birdlife, canoe and kayak activities are obtained along the river, whilst also providing passive surveillance and personal safety for open space users.
- The provision of a curvilinear concrete pathway that will allow open space users access at key viewing points at the river and take the user some distance from areas designated for wildlife habitat enhancement, thereby minimising disturbance to habitat zones by people and dogs.
- The majority of the area will remain under its current maintenance process of Council's slashed grass.
- Eradication of invasive weeds, which are a major impediment to biodiversity improvements, to designated areas along the river bank and to groups of existing indigenous trees and shrubs close to the river bank.
- Revegetation to the designated areas will include laying of biodegradable matting to reduce weed development and protection from erosion and planting with a selection of trees, shrubs, groundcovers and tufting plants that are within the areas Ecological Vegetation Class.
- Upgrade the function and filtration capability of one existing retarding basin, one large wetland, and two bio retention swales. The Hose Street retarding basin has recently been cleared of some vegetation and silt has been removed. The associated filtration wetland will be improved in capacity and weed eradication, and appropriate reeds and rushes to be planted.

Option A has identified key priority areas for weed eradication and revegetation to the river bank areas, covering an area of approximately 4.4 hectares as well as 6,500m^2 of the river embankment adjacent to the key priority revegetation areas, the large filtration wetland and three bio retention swales. Option A aims to reflect an ongoing budget and maintenance regime that is achievable for Council to undertake. The remaining 37.1 hectares will remain as regularly slashed grass by Council's maintenance team.

Option B is an aspirational, best case scenario approach that includes weed eradication and revegetation to the entire length of the river embankment and adjacent areas, covering a total area of approximately 13 hectares as well as the large filtration wetland and three bio retention swales. The remaining 28 hectares will remain as regularly slashed grass by Council's maintenance team.

1 INTRODUCTION

The Merri River, as a series of several creek lines, rises in the hills 20-30 kilometres north of Warrnambool, and flows through the city and into Stingray Bay. The Merri River is a significant attribute to the local community, environment and identity of Warrnambool, with approximately 30% of Warrnambool's population living within a 10 minute walk of the Merri River. The North Merri Open Space Master Plan provides an opportunity for environmental, cultural and recreational values within the Warrnambool community to be supported and improved, connecting to the local and wider Warrnambool community.

The North Merri Open Space Master Plan is guided by the South Merri Open Space Precinct Plan endorsed by Warrnambool City Council in 2019, the Merri River Landscape Guidelines (2020), and other Council strategic plans including Green Warrnambool (2018) and the Warrnambool Open Space Strategy (2014). The South Merri Open Space Precinct Plan documents opportunities and recommendations to the South Merri Open Space area, located adjacent to the North Merri Open Space area. The Merri River Landscape Guidelines provides landscape and revegetation recommendations specific to the context of the Merri River and its relevant character zones. Together, these opportunities and recommendations have been carefully considered in the preparation of the North Merri Open Space Master Plan, to provide connection and cohesion with the South Merri Open Space area and green corridors/biolinks throughout Warrnambool.

BACKGROUND OF THE NORTH MERRI OPEN SPACE AREA

The North Merri Open Space is an area of current and proposed improved public open space located north of the Merri River, between Ponting Drive and Johnstone Road to the east, and Caramut Road and Cassady's Bridge to the west. The North Merri Open Space is approximately 41 hectares, and is maintained by Warrnambool City Council. The North Merri Open Space spans a distance of approximately 3.3 kilometres along the Merri River edge, with the majority of the site being located within a flood zone. The North Merri Open Space, particularly the river embankment, provides habitat to some indigenous flora and fauna, with the Master Plan providing a significant opportunity for habitat values to be improved.

The North Merri Open Space is located in proximity to newly developed residential areas, including Wollaston Way and the Riverside Estate residential subdivisions. Residences and civil road works are still under development at the Riverland Estate, located to the western edge of North Merri Open Space. Witham Park and playspace located on the corner of Shaw Street and Goodall Street, appears to be the only open space asset within the residential subdivisions. A planning requirement for the development of the residential estates, was that there was to be no development within the existing flood plain zone, hence the large area of unencumbered open space becoming available, now known as North Merri Open Space.

Most dwellings within the residential estates are single storey on small to average sized residential allotments, ie. around 450 to 750 square metres. Dwelling footprints occupy a significant area to most allotments, resulting in limited outdoor space for residents to utilise and occupy within their properties. The North Merri Open Space will therefore be an important open space for semi-active recreation such as bike riding, walking dogs and informal ball games. The North Merri Open Space will provide opportunity for individuals and families to socialise with one another, which is an opportunity frequently referred to as absolutely necessary for the benefit of health and wellbeing within a community and neighbourhood.

PROJECT PARTNERS AND STAKHOLDERS

A major attribute to the success of the revegetation and planting program at the North Merri Open Space will be the extent of stakeholder groups who have already invested time and interest in the improvements to the Merri River and its surroundings. These are the combination of authorities, and the range of clubs and interest groups who have provided supporting resources and labour.

KEY FINDINGS OF THE SOUTH MERRI OPEN SPACE PRECINCT PLAN

The South Merri Open Space Precinct Plan documents the importance of seven parklands to the south side of the Merri River, extending from Manuka Drive in the west, to St James Park to the east. The parkland areas are currently underdeveloped and as described in the precinct plan, have the potential to become a popular recreational asset linked by an east-west connecting pathway. The seven existing parklands from west to east including their sizes are;

- Manuka Drive Reserve 2.7Ha;
- Woodend Road Reserve 10.8Ha;
- Platypus Park 1.1Ha;
- Russells Creek Reserve 2.4Ha;
- Bromfield Street 0.2Ha;
- Queens Road Reserve 2.7Ha;
- St James Park 4.8Ha.

Kayak launch located at Woodend Road Reserve

The South Merri Open Space Precinct Plan encompasses the seven key principles identified within the Warrnambool Open Space Strategy of 2014; accessible, adaptable, connected, efficient, diverse, equitable, and protective of the environment. An emphasis on local community networks and stakeholder engagement was made throughout the preparation of the South Merri Precinct Plan. Additionally, community consultation for the precinct plan occurred over two rounds, firstly in 2019 and secondly in 2020. The key themes derived from the community surveys, social media and online discussions in relation to the South Merri Open Space area were as follows:

- Access to the river entry points, and at least three pedestrian bridges at strategic locations;
- Connected trails, rather than disjointed trails;
- Protection of key view cones with the provision of stopping points, and rest spots with seating;
- Restoration of the natural environment and biodiversity;

- Recognition of the Eastern Maar Traditional Owners culture and their connection to the Merri River;
- Passive and active recreation, i.e. walking, dog walking, fishing, bird watching and kayaking/canoeing;
- Enhance a 'sense of place' through carefully sited key view cones, creation of activity areas, and play versus quiet spaces for quiet reflection and contemplation;

Based on the stakeholder and community engagement undertaken during 2019 and 2020, key action recommendations were established for the South Merri Open Space area, including:

- Improve pedestrian connections and loop paths by constructing concrete pathways;
- Provide two new pedestrian bridges, Manuka Drive, Woodend Road Reserve or Platypus Reserve, and a combined pedestrian and vehicle bridge at Bromfield Street to connect to the north side;
- Promote the precinct's cultural values, possible naming of reserve's trails and wetlands using Maar language (limit signage);
- Encourage health and wellbeing activities, i.e. walking, non-motorised water craft, such as kayaking and canoeing, and the creation of playspaces;
- Provide future recreation activities to both the south side and the north side of the Merri River, possible low key sport fields close to the Merri River School on the north side;
- Change dog off leash areas to dog on leash areas over a phased period;
- Provide universal access, safe and equitable for all members of the community;
- Provide bicycle and car parking implemented to the south side at certain parks;
- Provide interpretive signage on Rakali (the Native Water Rat), Hairy Burrowing Crayfish, Platypus, and native fish of Estuary Perch and Black Bream.

KEY FINDINGS OF THE MERRI RIVER LANDSCAPE GUIDELINES

The Merri River Landscape Guidelines characterises the various zones in which the Merri River flows through, including rural living, rural, urban, peri-urban, coastal and coastal-urban. The report provides guidelines and recommendations on revegetation and landscaping processes in the context of specific sections of the river, recognising that different sections will require different approaches based on their specific character, values and needs. The Merri River Landscape Guidelines states that there is less than 10% native vegetation remaining within Warrnambool, highlighting the significance of native indigenous revegetation as a means to provide habitat and corridors for threatened flora and fauna.

In the context of North Merri Open Space, the Merri River Landscape Guidelines classifies the area within an Urban Character Zone, where residential development is located on either side of the river. An Urban Floodway Zone buffer separates the Merri River from residential development to either side of the river. Within this character zone, significant areas of native vegetation have been cleared in the past, with some revegetation works having been undertaken.

Historical modelling of Ecological Vegetation Classes (EVCs), indicates that the entire Study Area was covered with EVC 53: Swamp Scrub prior to colonisation. EVC 53 Swamp Scrub is characterised by low-medium shrubs, dense vegetation and poorly drained sites. It is recommended that where possible, vegetation from the EVC 53 Swamp Scrub should be selected for revegetation and planting works within the North Merri Open Space.

The Merri River Landscape Guidelines recommends the planting of native indigenous species within the Urban Character Zone, and therefore the North Merri Open Space. The report also recognises that future planting works within the Urban Character Zone should also work to foster a people-friendly environment, including maintaining key views to public roads and open space, and minimising fire risk. A wider vegetation palette is therefore recommended by the Merri River Landscape Guidelines within this area, including EVC 53_63 Plains Earthy Woodlands, in order to achieve the desired aesthetic and functional outcomes of this specific zone and its urban character values and needs.

2 EXISTING CONDITIONS

The North Merri Open Space consists of flat terrain for most of the area. The majority of the flood plain area is managed by Warrnambool City Council's Operations Crew, by regular grass slashing. The far eastern edge of the flood plain area is used for cattle grazing. A couple of desire line tracks are further slashed at a lower blade setting to define informal tracks, linking Waldock Way to the Merri River.

There is a subtle formation of a low grassed knoll located at the termination projection of Hose Street, relatively close to the Merri River. The knoll is approximately 3 metres at the peak, spanning approximately 120 metres in length and 50 metres in width. Close to the river's edge, the grassed knoll provides a sense of solitude and seclusion from the nearby residential subdivision and open space. View cones are significant along the north bank of the river, particularly at bends in the river, of which there are several bends.

View of the grass knoll from Hose Street

Beyond the flood plain's edge and Waldock Way, the land rises toward Wollaston Road. The recent residential subdivisions discharge their stormwater drainage to the Merri River via a gross pollutant trap parallel to Kalan Street, the recently constructed and planted wetland at the end of Goodall Street and the well-established, but seriously compromised retarding basin and wetland at the termination of Hose Street.

Recently constructed and planted wetland at the end of Goodall Street

The North Merri Open Space has mostly been historically cleared and grazed, and as such is dominated by exotic grasses such as Couch *(Cynodon dactylon* var. *dactylon)*, Toowoomba Canary-grass *(Phalaris aquatica)*, Prairie Grass *(Bromus catharticus)* and Kikuyu *(Cenchrus clandestinus)*.

Small fragments of remnant and planted Swamp Scrub of low and moderate quality were recorded at the river bank and overbank zone. This vegetation type was typically dominated by Woolly Tea-tree (*Leptospermum lanigerum)*, with other species including Scented Paperbark (*Melaleuca squarrosa)* and Prickly Tea-tree (*L. continentale)*.

Tall Marsh vegetation was recorded at the river bank and toe zone in small patches. Due to the steep nature of much of the river bank, there are likely additional areas of Tall Marsh vegetation that were not recorded. Key species in Tall Marsh vegetation included Common Reed *Phragmites australis*, Water Ribbons (*Cycnogeton procerum)* and Cumbungi (*Typha* spp).

Typical indigenous species present within the constructed wetlands at the end of Goodall Street, include Slender Knotweed (*Persicaria decipiens),* Knobby Club-sedge (*Ficinia nodosa),* River Club-sedge (*Schoenoplectus tabernaemontani).*

Riparian plantings of species typical of Higher-rainfall Plains Grassy Woodland have been planted in patches along the river bank. Typical species include Swamp Gum (*Eucalyptus ovata)*, Blackwood (*Acacia melanoxylon),* Drooping Sheoak (*Allocasuarina verticillate),* Common Tussock-grass (*Poa labillardierei)* and Prickly Moses *(Acacia verticillata).*

A total of 76 plant taxa were recorded within the North Merri Open Space, including a combination of indigenous and non-indigenous species, which are listed within Appendix 1. The listed flora species recorded within 5 kilometres of the North Merri Open Space in the past 40 years are presented within Practical Ecology's Ecological Input Report contained within Appendix 1, along with a determination of their likelihood of occurrence (as informed by the results of both the Desktop and Site Assessments). All of these species were considered as having a low or low-moderate likelihood of occurring in the North Merri Open Space, owing to the extensive weed invasion and history of land clearing and grazing at the site.

EXISTING HABITAT LIST

The fauna identified incidentally during the Consultant Team's onsite assessment are presented in Table 1 below. Overall, a relatively high diversity of fauna species were observed, indicating the high value of habitat within North Merri Open Space.

Table 1: Fauna Identified Incidentally within North Merri Open Space

Scientific Name	Common Name	Record Type
Acanthiza pusilla	Brown Thornbill	Seen
Anas superciliosa	Pacific Black Duck	Seen
Ardea alba modesta	Eastern Great Egret	Seen
Cacatua sanguinea	Little Corella	Seen
Chenonetta jubata	Australian Wood Duck	Seen
Corvus spp.	Ravens and Crows	Seen
Cygnus atratus	Black Swan	Seen
Elanus axillaris	Black-shouldered Kite	Seen
Engaeus spp.	Burrowing Crayfish	Burrows observed
Falco berigora	Brown Falcon	Seen
Fulica atra	Eurasian Coot	Seen
Grallina cyanoleuca	Magpie-lark	Seen
Gymnorhina tibicen	Australian Magpie	Seen
Hirundo neoxena	Welcome Swallow	Seen
Malurus cyaneus	Superb Fairy-wren	Seen
Neochmia temporalis	Red-browed Finch	Seen
Phalacrocorax sulcirostris	Little Black Cormorant	Seen
Phalacrocorax varius	Pied Cormorant	Seen
Phylidonyris novaehollandiae	New Holland Honeyeater	Seen
****Pieris rapae***	Cabbage White Butterfly	Seen
Poliocephalus poliocephalus	Hoary-heading Grebe	Seen
Porphyrio melanotus	Australasian Swamphen	Seen
Rhipidura leucophrys	Willie Wagtail	Seen
Sericornis frontalis	White-burrowed Scrubwren	Seen
Teleogryllus commodus	Black Field Cricket	Seen

Scientific Name	Common Name	Record Type
Threskiornis molucca	Australian White Ibis	Seen
Threskiornis spinicollis	Straw-necked Ibis	Seen

The listed fauna species recorded within 5 kilometres of North Merri Open Space in the past 40 years are presented within Practical Ecology's Ecological Input Report contained within Appendix 1, along with a determination of their likelihood of occurrence (as informed by the results of both the Desktop and Site Assessments). Of these species, 19 were considered as having a moderate or higher likelihood of occurrence. For the remaining listed fauna species identified during the Desktop Assessment, the likelihood that they would occur within North Merri Open Space is considered low or low-moderate.

HABITAT ASSESSMENT

The focus with regard to fauna during the assessment was the consideration of fauna habitat values. Overall, North Merri Open Space supports moderate quality habitat for a wide range of species, owing to the fact that it has been extensively cleared. Areas of revegetation demonstrate that it is possible to enhance the quality of habitat for many species (particularly fauna), which can encourage them to return to the area. An assessment of habitat features in the Study Area is provided in the table below.

Table 2: Habitat Attribute Assessment

Habitat Attribute	Abundance	Description	Use by Flora/Fauna
Canopy trees	Low	Swamp Gums have been planted in the transitional zone. These trees are immature and lack hollows.	**General Use** Foraging and roosting habitat for birds, (e.g. Spotted Pardalote, New Holland Honeyeater), and microbats. **Listed Species** Foraging habitat for Grey-headed Flying Fox.
Tree Hollows and Tree fissures/cracks	Absent	The trees present on site are not of a sufficient size or age to produce hollows, fissures or cracks.	**General Use** Shelter for arboreal mammals (e.g. Brushtail Possum *Truchosurus cunninghamii),* birds, and microbats. **Listed Species** No specific habitat.
Well-developed shrub layer	Low	Small patches of shrubby vegetation have been planted in the transitional zone. Swamp Scrub vegetation typically forms dense thickets in a shrubby layer.	**General Use** Shelter, nesting and foraging habitat for small birds (e.g. White-browed Scrubwren, Red-browed Finch). **Listed Species** No specific habitat.
Diverse ground layer vegetation	Low	The ground layer of much of North Merri Open Space consists of mown lawn or mulched areas and	**General Use** Generally increases foraging opportunities for a greater diversity of fauna, and is more likely to support threatened flora.

Habitat Attribute	Abundance	Description	Use by Flora/Fauna
		lacks structural and floristic diversity.	
Logs	Absent	-	**General Use** Logs (particularly large logs) provide shelter for ground-dwelling fauna (e.g. reptiles, amphibians, mammals) and foraging resources for invertebrates.
Surface rock	Absent	-	**General Use** Shelter and sunning opportunities for reptiles and small mammals.
Leaf litter	Low	Regular mowing and limited areas of revegetation mean that the site has a generally low cover of leaf litter.	**General Use** Leaf litter is an important foraging resource particularly for invertebrates.
Waterways	Present	North Merri Open Space is bordered by the Merri River. The watercourse provides important habitat but is subject to several threats including: • Lack of instream habitat features (rocks, snags); • Pollution from agricultural and urban runoff; • Extensive clearing of riparian habitat; • Invasion of woody weeds (Willows, Poplars, Desert Ash).	**General Use** Important habitat for fish (e.g. Yarra Pygmy Perch, mammals (Rakali, Platypus), waterbirds (e.g. Eastern Great Egret) and invertebrates. **Listed Species** Shelter/foraging breeding habitat for Yarra Pygmy Perch, Platypus and listed waterbirds.
Riparian/fringing/instream vegetation	Low	Much of the riparian and fringing vegetation in North Merri Open Space has been cleared, however the areas that are present demonstrate its important habitat value.	**General Use** Foraging and breeding habitat for fish, birds, and mammals. **Listed Species** Foraging and breeding habitat for listed waterbirds, Swamp Skink, Hairy Burrowing Crayfish. Foraging habitat for White-bellied Sea Eagle.

3 MASTER PLAN STRATEGIES AND ACTIONS

The following strategies and actions are recommended to be implemented for the North Merri Open Space, with consideration to the connectivity and cohesion to the South Merri Open Space and the green corridors/biolinks throughout Warrnambool. These strategies and actions are documented within the Key Strategies Plan, contained in Appendix 3.

WEED ERADICATION AND MANAGEMENT

Incremental weed eradication and ongoing weed management will be essential for the successful development of vegetated areas within the North Merri Open Space, that can provide an effective habitat to local flora and fauna. As stated in Chapter 4, incremental weed eradication and management over a period of two to three years, will work to stabilise the embankment and reduce the ongoing presence of weeds.

It is recommended that priority for revegetation, including weed removal, is given to the stretches and groups of the existing planted indigenous trees and large shrubs to strengthen habitat areas and those stretches providing greater resistance to erosion through embankment stabilisation.

VIEW CONES

Sites of designated view cones from the North Merri Open Space towards the South Merri Open Space and along the river have been documented within the North Merri Master Plan, in line with the South Merri Precinct Plan. The view cones are to be established and maintained, working to promote the natural scenery of the Merri River, and building on the connection between the north and south banks. The view cones contribute to maintaining visual surveillance and safety for open space users.

INDIGENOUS TREES AND SHRUBS

Areas of indigenous trees and shrubs have been proposed along the north bank of the Merri River, and positioned to ensure key view cones are established and maintained within the North Merri Open Space area and the South Merri Open Space area. Recommended appropriate tree and shrub species are listed in Chapter 4. The provision of tree and shrub species will work to increase the habitat values for indigenous fauna, providing opportunities for foraging, roosting, shelter and nesting and the plants develop.

INDIGENOUS GRASS AND FORBS AREAS

Areas of indigenous grass and forbs species have been proposed to the north bank of the Merri River. Option A includes key priority areas for grass and forbs, and Option B includes grass and forbes to the length of the river bank. Habitat features that have been lost from the North Merri Open Space area are recommended to be reinstated within revegetated areas managed for conservation. In particular, rocks, logs and leaf litter should be placed on the ground layer to provide shelter and foraging resources for reptiles and invertebrates.

Where possible, restoring a shrub layer through denser planting (while maintaining important view lines) will improve habitat suitability for many fauna, particularly birds. This style of planting may be achievable closer to the water's edge, where the bank is relatively steep, so view lines are not disrupted. Recommended appropriate grass and forbs species are listed in Chapter 4.

MOWN/SLASHED GRASS AREAS

Currently the entire flood plain zone consists of regularly slashed grass/weeds maintained by Warrnambool City Council's Operations Crew, and a small

portion to the eastern end is grazed. This regular slashed mowing regime is to continue in line with Council's available operation budget for the remaining areas of the North Merri Open Space that are not revegetated, wetland or bio retention swale areas.

Proposed mown/slashed grass areas are located between the river's embankment planting and the residential subdivisions. The mown/slashed grassed areas will provide open space for the local community to utilise, with the future inclusion of an informal recreation field, with the possibility of lighting to be included to the northern end of the informal recreation field area. Due to the flood plain, no infrastructure will be proposed within the grassed area or the recreation field that lies within the flood plain area.

PEDESTRIAN AND CYCLIST CONNECTIVITY

Two new pedestrian and cyclist bridges, Manuka Drive and Platypus Reserve, and a combined pedestrian and vehicle bridge at Bromfield Street are proposed to provide pedestrian connectivity between the South Merri Open Spaces and the North Merri Open Space area. It is recommended that the pedestrian connection from Platypus Reserve is prioritised over the connection at Woodend Road Reserve, to allow for a key habitat and biodiversity zone within the North Merri Open Space, opposite Woodend Road Reserve. This will allow for the proposed key habitat and biodiversity zone to directly connect to the existing habitat values of the neighbouring recently planted wetland.

CONCRETE WALKWAY AND CYCLING TRAIL

A proposed concrete walkway and cycling trail through the North Merri Open Space will provide open space users a walking route, activating and connecting the length of the open space area. A concrete surface will ensure the longevity of the trail, given it is located on a flood plain. The pathway will be curvilinear in layout, following the general alignment of the river, however it is vital that the path deviates from the river's edge to allow wildlife habitat zones to be established with minimal disturbance by people and dogs.

EXISTING FILTRATION WETLAND AND BIO RETENTION SWALE UPGRADES

Upgrades to the existing filtration wetland and bio retention swale located at the end of Hose Street, and the two bio retention swales located to south of the Riverland Estate is recommended, including revegetation to these sites.

VEHICLE CONNECTIVITY

A combined pedestrian vehicle bridge at the Bromfield Street will provide vehicle connection between the communities on both sides of the river. A proposed sealed road will then link the connection to Wollaston Road to the north. A proposed unsealed road will provide vehicle access to the informal recreational field.

4 LANDSCAPE REVEGETATION PROCESS

Revegetation and planting works at the North Merri Open Space will provide an opportunity to enhance the habitat for native indigenous flora and fauna, and cater to the needs and values of the rapidly expanding local community. A key opportunity for the future revegetation and planting works on this site, is the existing stakeholder groups who have previously provided resources and labour in support of the Merri River and its associated environment. These authorities, clubs and interest groups will be a key asset in the future of the open space development and the ongoing support of the natural environment, sustainability and biodiversity.

As identified within the Merri River Landscaping Guidelines (2020), the North Merri Open Space lies within the Urban Character Zone. As such, revegetation and conservation strategies must be compatible with any adjoining uses such as residential development, roads and recreation spaces. Key conservation areas that prioritise habitat and biodiversity, have been identified within the North Merri Open Space Master Plan, as well as key recreation and open space zones.

WEED CONTROL

The eradication of weeds along the North Merri embankment is a major undertaking and commitment, both in replanting and ongoing maintenance. There are several issues that make weed control difficult. Firstly, the intermittent flooding and high-water flow of the Merri River, where any exposed embankments with revegetation will be vulnerable to washing out and undercutting erosion. The second is the past history of weed infestation and seed bank of weed species in the soil.

Weed control works should be staged and prioritised to minimise weed spread and to maximise the cost-effective use of resources. Given that infestations of multiple weeds are widespread across the site, it is recommended weed control works is prioritised by location, rather than by species.

Higher priority areas for weed control are generally:

- Small, new, and outlying infestations to prevent a seedbank from forming and to reduce the likelihoodof a large infestation developing;
- Areas that have a high risk of spread to other locations, such as boundary fence lines and roadsides; and
- Locations with high value assets (e.g. native vegetation of existing planted trees and large shrubs) with established infestations.

General weed management principles include:

- Prevention: Prioritise weed hygiene practices to prevent the introduction of weeds into weed-free areas;
- Eradication: Prioritise eradication of small, isolated infestations and early-stage invasions of weeds;
- Reduction or containment: where weeds are widespread or established, eradication may be impractical. Weed impact can be managed by progressively reducing the infestation size, containing spread, reducing the seed bank and reducing or preventing seed set; and
- Only revegetate with desired indigenous species to areas that maintenance resources can be guaranteed for an intensive period of at least two years following planting and a further two years of less intensive maintenance as planting develops.

REVEGETATION

Prior to undertaking any ecological restoration works, areas proposed for revegetation should first be thoroughly surveyed to assess the site's capacity for natural regeneration and recovery (SERA 2021). This survey should include an assessment of existing conditions, including determining the presence of any remnant or planted indigenous flora species, and the distribution and types of weed species present. Sourcing of plants for revegetation requires careful planning.

- Site Preparation – Weed and Pest Animal Control:

To prepare sites for revegetation, weed cover must first be reduced to negligible levels, typically through primary control and at least one follow-up treatment of weed regrowth. Weed control should occur in two seasonal rounds (i.e. once during November and once during July) to ensure the control of both warm season and cool season weeds.

Herbicide application (i.e. rig spraying, spot spraying) is likely to take multiple applications over time to reduce the soil-stored seed bank. The weed control methods required prior to revegetation will vary based on the existing condition of each site.

Weed control methods must be applied sensitively to avoid off-target damage to native flora. Pest herbivores such as rabbits and hares should be controlled at the site to prevent damage to plantings.

- Site Preparation – Soil Preparation:

Due to the presence of sensitive Aboriginal cultural values, soil disturbance (e.g. scraping, ripping, cultivating) cannot be undertaken at the site (Eastern Maar Aboriginal Corporation, pers comm, 2025).

To prepare the site for planting, in areas where there is water flow (including flood-prone areas), erosion control matting (i.e. jute matting) should be installed to suppress weeds, followed by planting of appropriate indigenous species of plants.

In areas not prone to inundation, clean selected wood mulch should be spread across the site to smother weeds and improve water infiltration (Greening Australia 2003). Wood mulch must be carefully sourced to ensure it does not contain contaminants or weed propagules.

- Planting:

Planting and seeding should be into moist soil if possible. Planting and seeding should be completed when the soil is moist but not waterlogged, during spring (Greening Australia 2003). Planting at this time allows the plantsto establish during the warmer months, when they are less susceptible to fungal attack and soil waterlogging.

Watering upon planting is beneficial as it removes air pockets at the roots and helps to establish good soil-root contact. Installing guards is also beneficial to protect the plant from herbivores and wind. Monitor the site to determine if ongoing watering will be necessary. Maintenance watering may be required during the first summer following the planting.

- Maintenance:

Any plantings are to be regularly monitored and maintained. Dead plants must be replaced, and tree guards and stakes replaced if they deteriorate before plants become established. Tree guards must be removed once plants become established and rabbit and hare populations are under control/eradicated.

Weeds and pasture grasses around plantings and under guards should be continually controlled to prevent competition for water, light, and nutrients. Control methods include hand weeding and careful spot spraying.

Depending on seasonal weather conditions following planting, some supplementary watering may be required during dry periods, until plants become established. Wetland areas may require ongoing aquatic vegetation management to remove biomass and nutrients.

- Monitoring and Key Performance Indicators:

Implementing other monitoring methodologies such as photo-points and flora surveys is highly recommended. This will allow both adaptive management as well as allowing the successes of vegetation management works to be recorded and shared.

Setting performance parameters (Key Performance Indicators) by Council Managers, enables Bush Crews and Revegetation Crews to work to targets and goals, which is important over the long term for both work satisfaction and the biodiversity values to the environment. The establishment of a regular monitoring program to record and document plant development, health and ecological condition with specific intensive maintenance recommendations made if required.

RECOMMENDED PLANT SPECIE PALETTE

The following plant specie palette lists the recommended appropriate plant specie selection based on the EVC 53 Swamp Scrub and EVC 55_63 Plains Grassy Woodland, with consideration to the site context and proximity to open space and recreation areas.

Lifeform	Scientific name	Common name	Existing mown grassy areas (EVC 55_63)	Indigenous grasses/forbs - higher ground (EVC 55_63, derived treeless form)	River bank (incl. indigenous grasses/ forbs) (EVC 53, EVC 55_63)	Indigenous tree plantings (EVC 55_63)	Wetlands (EVC 53, Melbourne Water Constructed Wetland species).
Forbs (<1 m)	*Acaena echinata*	Sheep's Burr		✓		✓	
Forbs (<1 m)	*Acaena novae-zelandiae*	Bidgee-widgee		✓	✓	✓	
Forbs (<1 m)	*Crassula helmsii*	Swamp Crassula			✓		✓
Forbs (<1 m)	*Dichondra repens*	Kidney Weed		✓	✓	✓	✓
Forbs (<1 m)	*Gonocarpus tetragynus*	Common Raspwort		✓		✓	
Forbs (<1 m)	*Hydrocotyle laxiflora*	Stinking Pennywort		✓		✓	
Forbs (<1 m)	*Hydrocotyle pterocarpa*	Wing Pennywort			✓		
Forbs (<1 m)	*Lobelia pratioides*	Poison Lobelia					✓
Forbs (<1 m)	*Oxalis perennans*	Grassland Wood-sorrel		✓	✓	✓	
Forbs (<1 m)	*Persicaria decipiens*	Slender Knotweed			✓		✓
Graminoids (<1 m)	*Anthosachne scaber* var. *scaber*	Common Wheat-grass		✓			
Graminoids (<1 m)	*Austrostipa bigeniculata*	Kneed Spear-grass		✓			
Graminoids (<1 m)	*Austrostipa mollis*	Supple Spear-grass		✓			

Lifeform	Scientific name	Common name	Existing mown grassy areas (EVC 55_63)	Indigenous grasses/forbs - higher ground (EVC 55_63, derived treeless form)	River bank (incl. indigenous grasses/ forbs) (EVC 53, EVC 55_63)	Indigenous tree plantings (EVC 55_63)	Wetlands (EVC 53, Melbourne Water Constructed Wetland species).
Graminoids (<1 m)	*Baumea articulata*	Jointed Twig-sedge					✓
Graminoids (<1 m)	*Carex appressa*	Tall Sedge			✓	✓	✓
Graminoids (<1 m)	*Carex tereticaulis*	Common Sedge					✓
Graminoids (<1 m)	*Dianella admixta*	Black-anther Flax-lily		✓	✓		
Graminoids (<1 m)	*Ficinia nodosa*	Knobby Club-rush					✓
Graminoids (<1 m)	*Gahnia clarkei*	Tall Saw-sedge			✓		✓
Graminoids (<1 m)	*Gahnia sieberiana*	Red-fruit Saw-sedge			✓		
Graminoids (<1 m)	*Isolepis fluitans*	Floating Club-sedge					✓
Graminoids (<1 m)	*Isolepis inundata*	Swamp Club-sedge					✓
Graminoids (<1 m)	*Juncus amabilis*	Hollow Rush					✓
Graminoids (<1 m)	*Juncus flavidus*	Yellow Rush					✓
Graminoids (<1 m)	*Juncus pallidus*	Pale Rush					✓
Graminoids (<1 m)	*Lomandra longifolia*	Spiny-headed Mat-rush			✓	✓	✓
Graminoids (<1 m)	*Microlaena stipoides* var. *stipoides*	Weeping Grass		✓	✓	✓	
Graminoids (<1 m)	*Phragmites australis*	Common Reed			✓		
Graminoids (<1 m)	*Poa labillardierei*	Common Tussock-grass			✓		✓

Lifeform	Scientific name	Common name	Existing mown grassy areas (EVC 55_63)	Indigenous grasses/forbs - higher ground (EVC 55_63, derived treeless form)	River bank (incl. indigenous grasses/ forbs) (EVC 53, EVC 55_63)	Indigenous tree plantings (EVC 55_63)	Wetlands (EVC 53, Melbourne Water Constructed Wetland species).
Graminoids (<1 m)	*Poa rodwayi*	Velvet Tussock-grass		✓			
Graminoids (<1 m)	*Rytidosperma racemosum* var. *racemosum*	Stiped Wallaby-grass		✓	✓	✓	
Graminoids (<1 m)	*Rytidosperma setaceum*	Bristly Wallaby-grass		✓			
Graminoids (<1 m)	*Themeda triandra*	Kangaroo Grass		✓			
Small Shrubs/ Prostrate Shrubs (<1 m)	*Bossiaea prostrata*	Creeping Bossiaea		✓		✓	
Small Shrubs/ Prostrate Shrubs (<1 m)	*Styphelia humifusa*	Cranberry Heath				✓	
Medium Shrubs (1-2 m)	*Acacia myrtifolia*	Myrtle Wattle			✓	✓	
Medium Shrubs (1-2 m)	*Coprosma quadrifida*	Prickly Currant-bush			✓	✓	
Medium Shrubs (1-2 m)	*Leptospermum scoparium*	Manuka			✓	✓	✓
Medium to large trees (>8 m)	*Acacia mearnsii*	Black Wattle				✓	
Medium to large trees (>8 m)	*Acacia melanoxylon*	Blackwood	✓		✓	✓	
Medium to large trees (>8 m)	*Allocasuarina verticillata*	Drooping Sheoak	✓		✓	✓	
Medium to large trees (>8 m)	*Eucalyptus ovata*	Swamp Gum	✓		✓	✓	
Medium to large trees (>8 m)	*Eucalyptus viminalis* subsp. *viminalis*	Manna Gum	✓			✓	
Large Shrubs and Small Trees (2-8 m)	*Acacia paradoxa*	Hedge Wattle			✓	✓	

Lifeform	Scientific name	Common name	Existing mown grassy areas (EVC 55_63)	Indigenous grasses/forbs - higher ground (EVC 55_63, derived treeless form)	River bank (incl. indigenous grasses/ forbs) (EVC 53, EVC 55_63)	Indigenous tree plantings (EVC 55_63)	Wetlands (EVC 53, Melbourne Water Constructed Wetland species).
Large Shrubs and Small Trees (2-8 m)	*Acacia pycnantha*	Golden Wattle			✓	✓	
Large Shrubs and Small Trees (2-8 m)	*Acacia verticillata*	Prickly Moses			✓	✓	
Large Shrubs and Small Trees (2-8 m)	*Bursaria spinosa*	Sweet Bursaria			✓	✓	
Large Shrubs and Small Trees (2-8 m)	*Leptospermum lanigerum*	Woolly Tea-tree			✓	✓	✓
Large Shrubs and Small Trees (2-8 m)	*Melaleuca squarrosa*	Scented Paperbark			✓	✓	✓
Large Shrubs and Small Trees (2-8 m)	*Melicytus dentatus*	Tree Violet			✓	✓	
Large Shrubs and Small Trees (2-8 m)	*Ozothamnus ferrugineus*	Tree Everlasting			✓	✓	

5 OPINION OF PROBABLE COSTS

The following Opinion of Probable Costs is based on the delivery, assuming the entire revegetation works were to be undertaken within the next twelve months, i.e. July 2025 – July 2026. Due to the extensive area and conditions of the site, it is recommended that weed control and revegetation works are undertaken incrementally, for each of the designated planting regimes. This will allow for the monitoring of the success of both weed control and revegetation, allowing for methods to be tested, recorded and altered if necessary. Two revegetation options have been provided within this Master Plan for consideration by Council:

Option A has identified key priority areas for weed eradication and revegetation to the river bank areas, covering an area of approximately 4.4 hectares as well as 6,500m^2 of the river embankment adjacent to the key priority revegetation areas, the large filtration wetland and three bio retention swales. Option A aims to reflect an ongoing budget and maintenance regime that is achievable for Council to undertake. The remaining 37.1 hectares will remain as regularly slashed grass by Council's maintenance team.

Option B is an aspirational, best case scenario approach that includes weed eradication and revegetation to the entire length of the river embankment and adjacent areas, covering a total area of approximately 13 hectares as well as the large filtration wetland and three bio retention swales. The remaining 28 hectares will remain as regularly slashed grass by Council's maintenance team.

The recommendation is for **Option A** to be undertaken over an incremental period of several years, due to Council's current resources available and budget restrictions. Option A is seen as the most achievable solution, that will ensure revegetation works, biodiversity and habitat values are continually enhanced and supported over an ongoing period of time.

	Total cost of inception (includes concrete pathway construction)	***Maintenance per annum for the first two years after inception***	***Maintenance per annum between year three and year five***	***Maintenance per annum from year six and beyond***
OPTION A	$2,210,748	$130,010	$86,195	$64,288
OPTION B	$2,598,958	$172,043	$94,622	$55,912

The inception and maintenance cost (for the first two years of maintenance), is documented for each regime as per below:

PLANTING REGIME A OPTION A - EMBANKMENT STRIP (Approximately 1,300 metres long by 5 metres wide, 6,500m^2)

Task	Item and unit	Rate per unit	Quantity	Cost	Units etc	Notes
Weed control and planting						
Initial weed control: herbicide applications (two applications of rig spray)	Labour (person day spraying with backpacks and rigs)	$ 640.00	3	$ 1,920.00		
	Herbicide per litre	$ 50.00	7	$ 350.00		
Initial weed control: physical weed removal	Equipment included (brushcutters, rakes, wool bales)			$ -		
	Labour (person days)	$ 640.00	7	$ 4,480.00		
	Off-site weed disposal fees	$ 80.00	4	$ 320.00		
Installation of jute matting	Jute matting	$ 5.70	6500	$ 37,050.00		Rolls of jute matting with slits and 3 pins per m2
	Labour	$ 640.00	7	$ 4,480.00	7	person days to lay jutematting
Planting with prostrate shrubs and ground covers and installation of plant guards.	Plants	$ 2.00	32500	$ 65,000.00	5	plants per m2
	Stakes/guards	$ 1.25	6500	$ 8,125.00	1	woody plant per m2 guarded
	Labour	$ 640.00	156	$ 99,840.00	250	Planting or guarding rate per 8 hour day
Maintenance						
Initial maintenance over two years: weed removal, replacement of plants and supplementary watering	Labour	$ 640.00	36	$ 23,040.00	1.5	Person days per month
	Materials (herbicide, rubbish costs etc)	$ 500.00	2	$ 1,000.00		
TOTAL EXCLUDING GST				**$ 245,605.00**		

PLANTING REGIME A OPTION B - EMBANKMENT STRIP (Approximately 3,000 metres long by 5 metres wide, 17,500m^2)

Task	Item and unit	Rate per unit	Quantity	Cost	Units etc	Notes
Weed control and planting						
Initial weed control: herbicide applications (two applications of rig spray)	Labour (person day spraying with backpacks and rigs)	$ 640.00	6	$ 3,840.00		
	Herbicide per litre	$ 50.00	20	$ 1,000.00		
Initial weed control: physical weed removal	Equipment included (brushcutters, rakes, wool bales)			$ -		
	Labour (person days)	$ 640.00	20	$ 12,800.00		
	Off-site weed disposal fees	$ 80.00	10	$ 800.00		
Installation of jute matting	Jute matting	$ 5.70	17500	$ 99,750.00		Rolls of jute matting with slits and 3 pins per m2
	Labour	$ 640.00	20	$ 12,800.00	20	person days to lay jutematting
Planting with prostrate shrubs and ground covers and installation of plant guards.	Plants	$ 2.00	87500	$ 175,000.00	5	plants per m2
	Stakes/guards	$ 1.25	17500	$ 21,875.00	1	woody plant per m2 guarded
	Labour	$ 640.00	420	$ 268,800.00	250	Planting or guarding rate per 8 hour day
Maintenance						
Initial maintenance over two years: weed removal, replacement of plants and supplementary watering	Labour	$ 640.00	144	$ 92,160.00	4	Person days per month
	Materials (herbicide, rubbish costs etc)	$ 500.00	4	$ 2,000.00		
TOTAL EXCLUDING GST				**$ 690,825.00**		

PLANTING REGIME B – EXISTING INDIGENOUS TREE AND SHRUB AREAS (Areas under existing indigenous trees and shrubs, to the top of the embankment, 1500m^2)

Task	Item	Rate per unit	Quantity	Cost	Units etc	Notes
Weed control and planting						
Initial weed control: herbicide applications (two applications, spot spray) and removal of dead material where needed	Labour (person day spraying with backpacks and rigs)	$ 640.00	6	$ 3,840.00		
	Herbicide per litre	$ 50.00	6	$ 300.00		
Installation of jute matting under existing trees	Jute matting	$ 5.70	1500	$ 8,550.00		Rolls of jute matting with slits and 3 pins per m2
	Labour	$ 640.00	4	$ 2,560.00	4	person days to lay jutematting
Planting with indigenous grasses, ground covers and prostrate shrubs	Plants	$ 2.00	9000	$ 18,000.00	6	plants per m2
	Stakes/guards	$ 1.25	0	$ -	0	woody plant for m2 guarded
	Labour	$ 640.00	36	$ 23,040.00	250	Planting or guarding rate per 8 hour day
Maintenance						
Initial maintenance over two years: weed removal, replacement of plants and supplementary watering	Labour	$ 640.00	48	$ 30,720.00	2	Person days per month
	Materials (herbicide, rubbish costs etc)	$ 500.00	4	$ 2,000.00		
TOTAL COST EXCLUDING GST				**$ 89,010.00**		

PLANTING REGIME C OPTION A – INDIGENOUS GRASSES AND FORBS (Establishment of indigenous grasses and forbs areas, 44,000m^2)

Task	Item	Rate per unit	Quantity	Cost	Units etc	Notes
Weed control and planting						
Initial weed control: herbicide applications (two applications, rig spray) - spot spray areas of exotic grass	Labour (person day spraying with backpacks and rigs)	$ 640.00	3	$ 1,920.00		
	Herbicide per litre	$ 50.00	3	$ 150.00		
Direct seeding native grasses and robust forbs	Seed by kg	$ 200.00	9	$ 1,800.00		Based on 20 kg per 10,000 m2
	Labour by person days	$ 640.00	2	$ 1,280.00		
Planting with indigenous grasses, forbs and scattered groups of trees	Plants	$ 2.00	180	$ 360.00		
	Stakes/guards	$ 1.25	180	$ 225.00		
	Labour	$ 640.00	2	$ 1,280.00	250	Planting or guarding rate per 8 hour day
Maintenance						
Initial maintenance over two years: weed removal, replacement of plants and supplementary watering	Labour	$ 640.00	36	$ 23,040.00	1.5	Person days per month
	Materials (herbicide, rubbish costs etc)	$ 500.00	10	$ 1,500.00		
TOTAL COST EXCLUDING GST				**$ 31,555.00**		

PLANTING REGIME C OPTION B – INDIGENOUS GRASSES AND FORBS (Establishment of indigenous grasses and forbs areas, 130,000m^2)

Task	Item	Rate per unit	Quantity	Cost	Units etc	Notes
Weed control and planting						
Initial weed control: herbicide applications (two applications, rig spray) - spot spray areas of exotic grass	Labour (person day spraying with backpacks and rigs)	$ 640.00	10	$ 6,400.00		
	Herbicide per litre	$ 50.00	10	$ 500.00		
Direct seeding native grasses and robust forbs	Seed by kg	$ 200.00	26	$ 5,200.00		Based on 20 kg per 10,000 m2
	Labour by person days	$ 640.00	6	$ 3,840.00		
Planting with indigenous grasses, forbs and scattered groups of trees	Plants	$ 2.00	500	$ 1,000.00		
	Stakes/guards	$ 1.25	500	$ 625.00		
	Labour	$ 640.00	4	$ 2,560.00	250	Planting or guarding rate per 8 hour day
Maintenance						
Initial maintenance over two years: weed removal, replacement of plants and supplementary watering	Labour	$ 640.00	96	$ 61,440.00	4	Person days per month
	Materials (herbicide, rubbish costs etc)	$ 500.00	10	$ 5,000.00		
TOTAL COST EXCLUDING GST				**$ 86,565.00**		

PLANTING REGIME D – EXISTING LARGE FILTRATION WETLAND (Revegetation of existing large filtration wetland, 11,450m^2)

Task	Item	Rate per unit	Quantity	Cost	Units etc	Notes
Weed control and planting						
Removal of weeds (herbicide/physical removal)	Labour (person day)	$ 640.00	6	$ 3,840.00		
	Herbicide per litre	$ 50.00	4	$ 200.00		
Earthworks	Equipment			$ -		
	Labour			$ -		
Macrophyte planting to edge	Plants	$ 2.00	5725	$ 11,450.00	2	Plants per m2
	Labour (person day)	$ 640.00	19	$ 12,213.33	300	plants installed per person day
Maintenance						
Initial maintenance over two years: weed removal, replacement of plants and supplementary watering	Labour (person day)	$ 640.00	48	$ 30,720.00	2	Person days per month
	Materials (herbicide, rubbish costs etc)	$ 500.00	4	$ 2,000.00		
TOTAL COST EXCLUDING GST				**$ 60,423.33**		

PLANTING REGIME E – EXISTING BIO RETENTION SWALE, SOUTH OF HOSE STREET (Revegetation of existing bio retention swale located south of Hose Street, 640m^2)

Task	Item	Rate per unit	Quantity	Cost	Units etc	Notes
Weed control and planting						
Removal of weeds (herbicide/physical removal)	Labour	$ 640.00	2	$ 1,280.00		
	Herbicide	$ 50.00	1	$ 50.00		
Macrophyte planting to edge	Plants	$ 2.00	1280	$ 2,560.00	2	Plants per m2
	Labour	$ 640.00	4	$ 2,560.00	300	plants installed per person day
Maintenance						
Initial maintenance over two years: weed removal, replacement of plants and supplementary watering	Labour	$ 640.00	3	$ 1,920.00		
	Materials	$ 500.00	1	$ 500.00		
TOTAL COST EXCLUDING GST				**$ 8,870.00**		

PLANTING REGIME F – EXISTING BIO RETENTION SWALE, EAST OF CASSADYS BRIDGE (Revegetation of existing bio retention swale located east of Cassadys Bridge)

On the basis of Planting Regime E, the Hose Street bio retention swale, Planting Regime F, the bio retention swale located east of Cassadys Bridge is slightly larger. A pro rata rate has been adopted of 1.5 times Planting Regime E. Therefore, $13,305.00 excluding GST.

TOTAL COST EXCLUDING GST **$ 13,305.00**

PLANTING REGIME G – EXISTING BIO RETENTION, SOUTH OF CASSADYS ESPLANADE (Revegetation of existing bio retention swale located south of Cassadys Esplanade)

On the basis of Planting Regime E and Planting Regime F, a pro rata rate has been adopted of 2 times Planting Regime F. Therefore, $26,610.00 excluding GST.

TOTAL COST EXCLUDING GST **$ 26,610.00**

PLANTING REGIME H – SCATTERED INDIGENOUS SPECIES TREE PLANTING (28 Hectares at 10-15 trees per hectare, as per GHCMA guidelines)

Task	Item	Rate per unit	Quantity	Cost	Units etc	Notes
Planting						
Indigenous tree planting. Allow 150mm diameter pots with tree guard, staking and jute mesh squares to each tree. Trees to be planted in clusters of 5-6 trees within each group	Plants	$ 20.00	420	$ 8,400.00		
	Labour	$ 15.00	420	$ 6,300.00		
Maintenance						
Initial maintenance over two years: weed removal, replacement of plants and supplementary watering. 3 hours per week for 420 trees	Labour	$ 60.00	312	$ 18,720.00		
TOTAL COST EXCLUDING GST				**$ 33,420.00**		

PLANTING REGIME I – SLASHED/MOWN GRASS **OPTION A** (37.1 Hectares of slashed/mown grassed area)

Task	Item	Rate per unit	Quantity	Cost
Maintenance				
Tractor and mulcher mower for grass cutting only to the existing grassed areas within the North Merri Open Space to be retained, undertaken 8 times per year	Tractor and mulcher mower for grass cutting only	$ 192.00/hectare	37.1 hectares x 8 times per year	$ 56,985.00

TOTAL COST EXCLUDING GST **$ 56,985.00**

PLANTING REGIME I – SLASHED/MOWN GRASS **OPTION B** (28 Hectares of slashed/mown grassed area)

Task	Item	Rate per unit	Quantity	Cost
Maintenance				
Tractor and mulcher mower for grass cutting only to the existing grassed areas within the North Merri Open Space to be retained, undertaken 8 times per year	Tractor and mulcher mower for grass cutting only	$ 192.00/hectare	28 hectares x 8 times per year	$ 43,008.00

TOTAL COST EXCLUDING GST **$ 43,008.00**

COLOURED CONCRETE PATHWAY (Approximately 3,300m long reinforced concrete path, with an assumed area of 9,900 m^2)

Task	Item	Rate per unit	Quantity	Cost
Concrete Pathway				
Supply and lay coloured concrete pathway. SL82 Reinforcement 20Mpa concrete over 50mm Class 2a FCR over compacted soil. As per the Eastern Maar Aboriginal Corporation requirements, no excavation is permitted at this site	Supply and lay reinforced coloured concrete path	$ 180.00/m^2	9,900m^2	$ 1,782,000.00
Soil				
Soil to be spread either side of the coloured reinforced concrete pathway once constructed, to ensure the pathway is level with the surrounding grassed area. Soil scraping is not permitted at this site	Supply and spread soil	$ 20/L^2	3,300m^2	$ 66,000.00

TOTAL COST EXCLUDING GST **$ 1,848,000.00**

6 APPENDICES

1. **Practical Ecology Ecological Input Report**
2. **Existing Trees and Large Shrubs Species Plan**
3. **Key Strategies Plan**
4. **Proposed Planting Plan**
5. **Proposed Plant Schedule, Quantities and Costs**
6. **Proposed Embankment Revegetation Cross Sections**

North Merri Open Space Landscape Master Plan: Ecological Input

29th April 2025

Mike Smith
Director, Michael Smith & Associates
M: 0418 172 863
E: mike@msalandurb.com.au

Dear Mike,

Practical Ecology has been engaged to provide ecological consultancy services for the North Merri Open Space Landscape Master Plan ('the Plan'). As stated in the RfQ, the intent of the Plan is to:

- Guide the planting of appropriate species and landscaping outcomes in the riparian corridor;
- Improve conservation and cultural values;
- Maintain the underlying purpose and function of the flood zone; and
- Create linkages with the South Merri open space precinct and adjoining residential open space areas.

The findings of our desktop review and site assessment and resulting recommendations are detailed in the sections below.

1. Existing Conditions

1.1 Vegetation

1.1.1 Modelled Vegetation

Historical modelling of ecological vegetation classes (EVCs), indicates that the entire Study Area was covered with EVC 53: Swamp Scrub prior to colonisation (DSE 2005).

Swamp Scrub is described by (DSE 2004) as *'Closed scrub to 8 metres tall at low elevations on alluvial deposits along streams or on poorly drained sites with high nutrient and water availability. Soils vary from organic loams to fine silts and peats, which are inundated during the wetter months of the year and is dominated by Woolly Tea-tree* Leptospermum lanigerum *which often forms a dense impenetrable thicket, out-competing other species. Emergent trees (eg. Swamp Gum* Eucalyptus ovata*) may sometimes be present. Where light penetrates to ground level, a moss/lichen/liverwort herbaceous ground cover is often present.'*

EVC 55: Plains Grassy Woodland is modelled as occurring north of the Study Area (DSE 2005). As the average annual rainfall in the area is greater than 700 millimetres (BOM 2025), EVC 55_63 is the most likely to occur in the Study Area.

EVC 55_63 Plains Grassy Woodland is described by (DSE 2004) as *'An open, eucalypt woodland to 15 metres tall or Acacia/Sheoak woodland to 10 metres tall. Occupies poorly drained, fertile soils on flat or gently undulating plains at low elevations. The understorey consists of a few sparse shrubs over a species-rich grassy and herbaceous ground layer. This variant occupies areas receiving greater than 700 millimetres annual rainfall.'*

1.1.2 Existing Vegetation

- The Study Area has mostly been historically cleared and grazed, and as such is dominated by exotic grasses such as Couch **Cynodon dactylon* var. *dactylon*, Toowoomba Canary-grass **Phalaris aquatica*, Prairie Grass **Bromus catharticus* and Kikuyu **Cenchrus clandestinus*.

- Small fragments of remnant and planted Swamp Scrub of low and moderate quality were recorded at the river bank and overbank zone. This vegetation type was typically dominated by Woolly Tea-tree *Leptospermum lanigerum*, with other species including Scented Paperbark *Melaleuca squarrosa* and Prickly Tea-tree *L. continentale*.

- Tall Marsh was recorded at the river bank and toe zone in small patches. Due to the steep nature of much of the river bank, there are likely additional areas of Tall Marsh that were not recorded. Key species in Tall Marsh included Common Reed *Phragmites australis*, Water Ribbons *Cycnogeton procerum* and Cumbungi *Typha* spp.

- Constructed Wetlands have been established in the Study Area to retain and treat stormwater runoff before it enters the river. Typical indigenous species present include Slender Knotweed *Persicaria decipiens,* Knobby Club-sedge *Ficinia nodosa*, River Club-sedge *Schoenoplectus tabernaemontani*.

- Riparian plantings of species typical of Higher-rainfall Plains Grassy Woodland have been installed in patches along the river bank. Typical species include Swamp Gum *Eucalyptus ovata*, Blackwood *Acacia melanoxylon*, Drooping Sheoak *Allocasuarina verticillata*, Common Tussock-grass *Poa labillardierei* and Prickly Moses *Acacia verticillata*.

1.1.3 Listed Ecological Communities

Table 1. Listed ecological communities potentially occurring within 5 km of the Study Area.

Listing Status*	Community: Description	Present within Study Area?
FFG Act		
n/a	Western Basalt Plains (River Red Gum) Grassy Woodland	**No**
EPBC Act		
EN	Giant Kelp Marine Forests of South East Australia	**No**
VU	Subtropical and Temperate Coastal Saltmarsh	**No**
CR	Natural Temperate Grassland of the Victorian Volcanic Plain	**No**
EN	Assemblages of species associated with open-coast salt-wedge estuaries of western and central Victoria ecological community	**No**
CR	Grassy Eucalypt Woodland of the Victorian Volcanic Plain	**No**

1.1.4 Trees

No Large Trees as per the *Guidelines for the Removal, Destruction and Lopping of Native Vegetation* (DELWP 2017) were recorded in the Study Area.

1.2 Flora

A total of 76 plant taxa were recorded in the Study Area, including a combination of indigenous and non-indigenous species, which are listed in Appendix 1.

1.2.1 Listed Flora

The listed flora species recorded within 5 kilometres of the Study Area in the past 40 years are presented in Appendix 2 along with a determination of their likelihood of occurrence (as informed by the results of both the Desktop and Site Assessments). All of these species were considered as having a low or low-moderate likelihood of occurring in the Study Area, owing to the extensive weed invasion and history of land clearing and grazing at the site.

1.3 Fauna

The fauna identified incidentally during the Site Assessment are presented in **Error! Reference source not found.**. Overall, a relatively high diversity of fauna species were observed, indicating the high value of habitat within the Study Area.

Table 2. Fauna recorded.

Scientific Name	Common Name	Record Type
Acanthiza pusilla	Brown Thornbill	Seen
Anas superciliosa	Pacific Black Duck	Seen
Ardea alba modesta	Eastern Great Egret	Seen
Cacatua sanguinea	Little Corella	Seen
Chenonetta jubata	Australian Wood Duck	Seen
Corvus spp.	Ravens and Crows	Seen
Cygnus atratus	Black Swan	Seen
Elanus axillaris	Black-shouldered Kite	Seen
Engaeus spp.	Burrowing Crayfish	Burrows observed
Falco berigora	Brown Falcon	Seen
Fulica atra	Eurasian Coot	Seen
Grallina cyanoleuca	Magpie-lark	Seen
Gymnorhina tibicen	Australian Magpie	Seen
Hirundo neoxena	Welcome Swallow	Seen
Malurus cyaneus	Superb Fairy-wren	Seen
Neochmia temporalis	Red-browed Finch	Seen
Phalacrocorax sulcirostris	Little Black Cormorant	Seen
Phalacrocorax varius	Pied Cormorant	Seen
Phylidonyris novaehollandiae	New Holland Honeyeater	Seen
Pieris rapae	Cabbage White Butterfly	Seen
Poliocephalus poliocephalus	Hoary-headed Grebe	Seen
Porphyrio melanotus	Australasian Swamphen	Seen
Rhipidura leucophrys	Willie Wagtail	Seen

Scientific Name	Common Name	Record Type
Sericornis frontalis	White-browed Scrubwren	Seen
Teleogryllus commodus	Black Field Cricket	Seen
Threskiornis molucca	Australian White Ibis	Seen
Threskiornis spinicollis	Straw-necked Ibis	Seen

1.3.1 Listed Fauna

The listed fauna species recorded within 5 kilometres of the Study Area in the past 40 years are presented in Appendix 3 along with a determination of their likelihood of occurrence (as informed by the results of both the Desktop and Site Assessments). Of these species, 19 were considered as having a moderate or higher likelihood of occurrence, as listed below in Table 3.

For the remaining listed fauna species identified during the Desktop Assessment, the likelihood that they would occur within the Study Area is considered low or low-moderate as per Appendix 2.

Table 3. Listed fauna species with a moderate or higher likelihood of occurrence.

Listing Status ^			Scientific Name	Common Name	Likelihood Of Occurrence
Treaty	EPBC	FFG			
		Vu	*Anseranas semipalmata*	Magpie Goose	High
C,J		Vu	*Ardea alba modesta*	Eastern Great Egret	High
		Cr	*Ardea intermedia plumifera*	Plumed Egret	High
		Vu	*Biziura lobata*	Musk Duck	Moderate-high
		En	*Egretta garzetta*	Little Egret	Moderate
		Vu	*Engaeus sericatus*	Hairy Burrowing Crayfish	Moderate
		Th	*Euastacus armatus*	Murray Spiny Crayfish	High
C		En	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	Moderate-high
		Vu	*Hieraaetus morphnoides*	Little Eagle	Moderate
C,R,J	VU	Vu	*Hirundapus caudacutus*	White-throated Needletail	Moderate-high
	EN	En	*Lissolepis coventryi*	Swamp Skink	Moderate
	EN	Vu	*Nannoperca obscura*	Yarra Pygmy Perch	High
		Vu	*Ornithorhynchus anatinus*	Platypus	High
		Vu	*Oxyura australis*	Blue-billed Duck	Moderate
B,C			*Plegadis falcinellus*	Glossy Ibis	Moderate
	VU	Vu	*Pteropus poliocephalus*	Grey-headed Flying-fox	Moderate
		Vu	*Spatula rhynchotis*	Australasian Shoveler	Moderate
		En	*Stictonetta naevosa*	Freckled Duck	Moderate

* Listing Status Key:

Treaty: **B** = Bonn Convention; and **C**, **J** and **R** = China-, Japan- and Republic of Korea-Australia Migratory Bird Agreements.

EPBC Act: **EX** = Extinct; **CR** = Critically endangered; **EN** = Endangered; **VU** = Vulnerable; and **CD** = Conservation dependant.

FFG Act: **ex** = Extinct; **rx** = Regionally Extinct; **wx** = Extinct in the Wild; **cr** = Critically Endangered; **en** = Endangered; **vu** = Vulnerable; **th** = Threatened **nt** = Near Threatened; and **dd** = Data Deficient.

1.3.2 Habitat Assessment

The focus with regards to fauna during the assessment was the consideration of fauna habitat values. Overall, the Study Area supports moderate quality habitat for a wide range of species, owing to the fact that it has been extensively cleared. Areas of revegetation demonstrate that it is possible to enhance the quality of habitat for many species (particularly fauna), which can encourage them to return to the area.

An assessment of habitat features in the Study Area is provided in the table below.

Table 4. Habitat Attribute Assessment

Habitat Attribute	Abundance	Description	Use by Flora/Fauna
Canopy trees	Low	Swamp Gums have been planted in the transitional zone. These trees are immature and lack hollows.	**General Use** Foraging and roosting habitat for birds, (e.g. Spotted Pardalote, New Holland Honeyeater), and microbats. **Listed Species** Foraging habitat for Grey-headed Flying-fox.
Tree Hollows and Tree fissures/cracks	Absent	The trees present on site are not of a sufficient size or age to produce hollows, fissures or cracks.	**General Use** Shelter for arboreal mammals (e.g. Brushtail Possum *Trichosurus cunninghamii*), birds, and microbats. **Listed Species** No specific habitat.
Well-developed shrub layer	Low	Small patches of shrubby vegetation have been planted in the transitional zone. Swamp Scrub vegetation typically forms dense thickets in a shrubby layer.	**General Use** Shelter, nesting and foraging habitat for small birds (e.g. White-browed Scrubwren, Red-browed Finch). **Listed Species** No specific habitat.
Diverse ground layer vegetation	Low	The ground layer of much of the Study Area consists of mown lawn or mulched areas and lacks structural and floristic diversity.	**General Use** Generally increases foraging opportunities for a greater diversity of fauna, and is more likely to support threatened flora.
Logs	Absent	-	**General Use** Logs (particularly large logs) provide shelter for ground-dwelling fauna (e.g. reptiles, amphibians, mammals) and foraging resources for invertebrates.
Surface rock	Absent	-	**General Use** Shelter and sunning opportunities for reptiles and small mammals.
Leaf litter	Low	Regular mowing and limited areas of revegetation mean that the site has a generally low cover of leaf litter.	**General Use** Leaf litter is an important foraging resource particularly for invertebrates.

Habitat Attribute	Abundance	Description	Use by Flora/Fauna
Waterways	Present	The Study Area is bordered by the Merri River. The watercourse provides important habitat but is subject to several threats including: • Lack of instream habitat features (rocks, snags) • Pollution from agricultural and urban runoff • Extensive clearing of riparian habitat • Invasion of woody weeds (Willows, Poplars, Desert Ash).	**General Use** Important habitat for fish (e.g. Yarra Pygmy Perch), mammals (Rakali, Platypus), waterbirds (e.g. Eastern Great Egret) and invertebrates. **Listed Species** • Shelter/foraging breeding habitat for Yarra Pygmy Perch, Platypus and listed waterbirds
Riparian/fringing/instream vegetation	Low	Much of the riparian and fringing vegetation in the Study Area has been cleared, however the areas that are present demonstrate its important habitat value.	**General Use** Foraging and breeding habitat for fish, birds, and mammals. **Listed Species** • Foraging and breeding habitat for listed waterbirds, Swamp Skink, Hairy Burrowing Crayfish • Foraging habitat for White-bellied Sea Eagle

2. Landscaping/Restoration Zones

In the Merri River Landscaping Guidelines (July 2020), the Study Area lies within the Urban Character Zone. As such, revegetation must be compatible with any adjoining uses such as residential development, roads and recreation spaces.

Table 5. Description of Landscaping and Restoration Zones

Zone	Description	Existing Conditions	Future Use	Reference EVCs
Toe	Between the natural water level and the lower part of the bank. Susceptible to erosion due to fluctuations and sometimes lack of vegetation.	Dominated by exotic species, with scattered patches of remnant Tall Marsh and Swamp Scrub.	Conservation	Tall Marsh, Swamp Scrub
Upper Bank	From the toe to floodway on river bank	Mostly cleared and dominated by exotic pasture grasses, with scattered indigenous plantings.	Conservation	Swamp Scrub, Plains Grassy Woodland (EVC 55_63).

Zone	Description	Existing Conditions	Future Use	Reference EVCs
Wetland	Two constructed wetlands and three stormwater retarding basins to retard and treat stormwater from adjacent residential developments.	• The Waldock Way Wetland is recently constructed and has been revegetated with indigenous aquatic and semi-aquatic species typical of Water-Sensitive Urban Design. • The large retarding basin near Cassady's Bridge is dominated by weeds. • Two constructed wetlands south of Hose Street are infested with weeds.	Conservation/ Stormwater treatment	None- novel ecosystem installed with indigenous wetland plants.
Higher Ground	Open space extending from the river upper bank to roadside. Higher elevation, although still subject to flooding.	Predominantly cleared and dominated by exotic pasture grasses. Scattered plantings of newly established small trees.	Conservation/open space	Swamp Scrub, Plains Grassy Woodland (EVC 55_63).

3. Management Considerations and Recommendations

3.1 Weed Control

Weed control works should be staged and prioritised to minimise weed spread and to maximise the cost-effective use of resources. Given that infestations of multiple weeds are widespread across the site, we recommend prioritising weed control works by location, rather than by species.

Higher priority areas for weed control are generally (LLS 2016):

- Small, new, and outlying infestations to prevent a seedbank from forming and to reduce the likelihood of a large infestation developing;
- Areas that have a high risk of spread to other locations, such as boundary fence lines and roadsides; and
- Locations with high value assets (e.g. native vegetation) with established infestations.

General weed management principles include (LLS 2016):

- Prevention: Prioritise weed hygiene practices to prevent the introduction of weeds into weed-free areas;
- Eradication: Prioritise eradication of small, isolated infestations and early-stage invasions of weeds; and
- Reduction or containment: where weeds are widespread or established, eradication may be impractical. Weed impact can be managed by progressively reducing infestation size, containing spread, reducing the seed bank and reducing or preventing seed set.

3.2 Revegetation

Prior to undertaking any ecological restoration works, areas proposed for revegetation should first be thoroughly surveyed to assess the site's capacity for natural regeneration and recovery (SERA 2021). This survey should include an assessment of existing conditions, including determining the presence of any remnant or planted indigenous flora species, and the distribution and types of weed species present.

Sourcing of plants for revegetation requires careful planning

3.2.1 Site Preparation – Weed and Pest Animal Control

To prepare sites for revegetation, weed cover must first be reduced to negligible levels, typically through primary control and at least one follow-up treatment of weed regrowth. Weed control should occur in two seasonal rounds (i.e. once during November and once during July) to ensure the control of both warm season and cool season weeds.

Herbicide application (i.e. rig spraying, spot spraying) is likely to take multiple applications over time to reduce the soil-stored seed bank. The weed control methods required prior to revegetation will vary based on the existing condition of each site.

Weed control methods must be applied sensitively to avoid off-target damage to native flora.

Pest herbivores such as rabbits and hares should also be controlled at the site to prevent damage to plantings.

3.2.2 Site Preparation – Soil Preparation

Due to the presence of sensitive Aboriginal cultural values, soil disturbance (e.g. scraping, ripping, cultivating) cannot be undertaken at the site (Eastern Maar Aboriginal Corporation, pers comm, 2025).

To prepare the site for planting, in areas where there is water flow (including flood-prone areas), erosion control matting (i.e. jute matting) should be installed to suppress weeds.

In areas not prone to inundation, mulch should be spread across the site to smother weeds and improve water infiltration (Greening Australia 2003). Mulch must be carefully sourced to ensure it does not contain contaminants or weed propagules.

3.2.3 Planting

Planting and seeding should be into moist soil if possible. Planting and seeding should be completed when the soil is moist but not waterlogged, during spring (Greening Australia 2003). Planting at this time allows the plants to establish during the warmer months, when they are less susceptible to fungal attack and soil waterlogging.

Watering upon planting is beneficial as it removes air pockets at the roots and helps to establish good soil-root contact. Installing guards is also beneficial to protect the plant from herbivores and wind.

Monitor the site to determine if ongoing watering will be necessary. Maintenance watering may be required during the first summer following the planting.

3.2.4 Maintenance

Any plantings are to be regularly monitored and maintained. Dead plants must be replaced, and tree guards and stakes replaced if they deteriorate before plants become established. Tree guards must be removed once plants become established.

Weeds and pasture grasses around plantings and under guards should be continually controlled to prevent competition for water, light, and nutrients. Control methods include hand weeding and careful spot spraying.

Depending on seasonal weather conditions following planting, some supplementary watering may be required during dry periods, until plants become established.

Wetland areas may require ongoing aquatic vegetation management to remove biomass and nutrients.

3.2.5 Monitoring

Implementing other monitoring methodologies such as photo-points and flora surveys is also highly recommended. This will allow both adaptive management as well as allowing the successes of vegetation management works to be recorded and shared.

3.3 Restoration of Habitat Features

We recommend reinstating habitat features that have been lost from the Study Area within revegetated areas managed for conservation. In particular, rocks and logs should be installed in the ground layer to provide shelter and foraging resources for reptiles and invertebrates.

Where possible, restoring a shrub layer through denser plantings (while maintaining important view lines in the master) will improve habitat suitability for many fauna, particularly birds. This style of planting may be achievable closer to the water's edge, where the bank is relatively steep, so view lines are not disrupted.

References

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Greening Australia (2003) *Revegetation techniques – A guide for establishing native vegetation in Victoria*.

LLS (2016) *Preparing a Whole of Property Weed Management Plan: A land managers guide*. NSW Government, Cooma.

SERA (2021) *National standards for the practice of ecological restoration in Australia*. Society of Ecological Restoration Australasia.

Appendix 1. Flora Recorded in Study Area

^ Key	
Origin	
*: Exotic species; #: Victorian native species extended beyond natural range; and Empty: Indigenous species.	
EPBC Act Listing Status	**FFG Act Listing Status**
EX: Extinct; CR: Critically endangered; EN: Endangered; VU: Vulnerable; and CD: Conservation dependant.	ex: Extinct; rx: Regionally Extinct; wx: Extinct in the Wild; cr: Critically Endangered; en: Endangered; vu: Vulnerable; nt: Near Threatened; and dd: Data Deficient.
	FFG Act Protection Category
	R: Restricted Use; and G: General Protection.

Origin ^	Scientific Name	Common Name	Listing Status ^		FFG Protection Category ^
			EPBC Act	FFG Act	
	Ferns and Fern Allies				
	Azolla rubra	Pacific Azolla	–	–	–
	Monocotyledons				
*	*Bromus catharticus*	Prairie Grass	–	–	–
*	*Bromus diandrus*	Great Brome	–	–	–
	Carex appressa	Tall Sedge	–	–	–
*	*Cenchrus clandestinus*	Kikuyu	–	–	–
	Cycnogeton procerum s.s.	Common Water-ribbons	–	–	–
*	*Cynodon dactylon var. dactylon*	Couch	–	–	–
*	*Cyperus eragrostis*	Drain Flat-sedge	–	–	–
*	*Dactylis glomerata*	Cocksfoot	–	–	–
*	*Ehrharta erecta*	Panic Veldt-grass	–	–	–
	Ficinia nodosa	Knobby Club-sedge	–	–	–
	Lomandra longifolia	Spiny-headed Mat-rush	–	–	–
*	*Phalaris aquatica*	Toowoomba Canary-grass	–	–	–
	Phragmites australis	Common Reed	–	–	–
	Poa labillardierei	Common Tussock-grass	–	–	–
	Schoenoplectus tabernaemontani	River Club-sedge	–	–	–
	Typha domingensis	Narrow-leaf Cumbungi	–	–	–
	Typha orientalis	Broad-leaf Cumbungi	–	–	–
	Dicotyledons				
	Acacia mearnsii	Black Wattle	–	–	–
	Acacia melanoxylon	Blackwood	–	–	R
	Acacia stricta	Hop Wattle	–	–	R
	Acacia verticillata	Prickly Moses	–	–	–
	Allocasuarina verticillata	Drooping Sheoak	–	–	–
*	*Amaranthus powellii*	Powell's Amaranth	–	–	–
*	*Arctotheca calendula*	Cape Weed	–	–	–
	Brassicaceae spp.	Crucifer	–	–	–
	Bursaria spinosa	Sweet Bursaria	–	–	–
	Callistemon viminalis	Weeping Bottlebrush	–	–	–
	Calystegia sepium subsp. roseata	Large Bindweed	–	–	–
	Cassinia aculeata subsp. aculeata	Common Cassinia	–	–	–
*	*Chenopodium album*	Fat Hen	–	–	–
*	*Cirsium vulgare*	Spear Thistle	–	–	–
*	*Conium maculatum*	Hemlock	–	–	–

Origin <	Scientific Name	Common Name	Listing Status ^		FFG Protection Category <
			EPBC Act	FFG Act	
*	*Coprosma repens*	Mirror Bush	-	-	-
*	*Cotoneaster spp.*	Cotoneaster	-	-	-
*	*Crataegus monogyna*	Hawthorn	-	-	-
*	*Delairea odorata*	Cape Ivy	-	-	-
*	*Dipsacus fullonum*	Wild Teasel	-	-	-
	Epilobium billardierianum	Variable Willowherb	-	-	-
*	*Erigeron bonariensis*	Flaxleaf Fleabane	-	-	-
	Eucalyptus camaldulensis	River Red-gum	-	-	-
	Eucalyptus ovata	Swamp Gum	-	-	-
*	*Foeniculum vulgare*	Fennel	-	-	-
*	*Fraxinus angustifolia*	Desert Ash	-	-	-
*	*Genista monspessulana*	Montpellier Broom	-	-	-
	Gynatrix pulchella s.s.	Hemp Bush	-	-	-
*	*Hedera spp.*	Ivy	-	-	-
*	*Helminthotheca echioides*	Ox-tongue	-	-	-
*	*Hypochaeris radicata*	Flatweed	-	-	-
*	*Leonotis leonurus*	Lion's Ear	-	-	-
	Leptospermum continentale	Prickly Tea-tree	-	-	-
	Leptospermum lanigerum	Woolly Tea-tree	-	-	-
*	*Lycium ferocissimum*	African Box-thorn	-	-	-
	Malva spp.	Mallow	-	-	-
	Melaleuca squarrosa	Scented Paperbark	-	-	-
	Modiola caroliniana	Red-flower Mallow	-	-	-
	Oxalis spp.	Wood Sorrel	-	-	-
	Ozothamnus ferrugineus	Tree Everlasting	-	-	-
	Passiflora spp.	Passion Flower	-	-	-
	Persicaria decipiens	Slender Knotweed	-	-	-
#	*Pittosporum undulatum*	Sweet Pittosporum	-	-	-
*	*Plantago lanceolata*	Ribwort	-	-	-
*	*Polygonum aviculare s.s.*	Hogweed	-	-	-
#	*Portulaca oleracea*	Common Purslane	-	-	-
	Rumex spp.	Dock	-	-	-
*	*Salix babylonica s.s.*	Weeping Willow	-	-	-
*	*Salix cinerea*	Grey Sallow	-	-	-
*	*Salix matsudana 'Tortuosa'*	Tortured Willow	-	-	-
*	*Salix spp.*	Willow	-	-	-
*	*Salix X fragilis*	Crack Willow	-	-	-
*	*Silybum marianum*	Variegated Thistle	-	-	-
#	*Solanum aviculare*	Kangaroo Apple	-	-	-
*	*Sonchus oleraceus*	Common Sow-thistle	-	-	-
*	*Symphyotrichum subulatum*	Aster-weed	-	-	-
*	*Trifolium repens var. repens*	White Clover	-	-	-
*	*Verbena bonariensis var. bonariensis s.s.*	Purple-top Verbena	-	-	-
*	*Vicia sativa*	Common Vetch	-	-	R

Appendix 2. Likelihood of Occurrence: Listed Flora

^Listing Status Key	
EPBC Act Listing Status **EX:** Extinct; **CR**: Critically endangered; **EN**: Endangered; **VU**: Vulnerable; and **CD**: Conservation dependant.	**FFG Act Listing Status** **ex:** Extinct; **rx**: Regionally Extinct; **wx**: Extinct in the Wild; **cr**: Critically Endangered; **en**: Endangered; **vu**: Vulnerable; **th:** Threatened **nt**: Near Threatened; and **dd**: Data Deficient.

Source	Listing Status ^		Scientific Name	Common Name	Individuals Recorded	Last Record	Likelihood of Occurrence
	EPBC	FFG					
PMST	VU		*Amphibromus fluitans*	River Swamp Wallaby-grass	N/A	N/A	Low
VBA		En	*Dianella callicarpa*	Swamp Flax-lily	10004	2023	Low-moderate
VBA		En	*Exocarpos syrticola*	Coast Ballart	1	2008	Low
PMST	VU	Vu	*Glycine latrobeana*	Clover Glycine	N/A	N/A	Low
VBA		En	*Lachnagrostis robusta*	Salt Blown-grass	1	1997	Low
PMST	VU	En	*Lepidium aschersonii*	Spiny Peppercress	N/A	N/A	Low
PMST	EN	En	*Lepidium hyssopifolium*	Basalt Peppercress	N/A	N/A	Low
VBA		En	*Melaleuca armillaris subsp. armillaris*	Giant Honey-myrtle	1	2018	Low
VBA		En	*Poa billardierei*	Coast Fescue	21	2020	Low
PMST	VU	Cr	*Prasophyllum spicatum*	Dense Leek-orchid	N/A	N/A	Low
PMST	EN	Cr	*Prasophyllum suaveolens*	Fragrant Leek-orchid	N/A	N/A	Low
PMST	VU	En	*Pterostylis chlorogramma*	Green-striped Greenhood	N/A	N/A	Low
PMST	VU		*Pterostylis cucullata*	Leafy Greenhood	N/A	N/A	Low
VBA		En	*Roepera billardierei*	Coast Twin-leaf	1	2000	Low
PMST	VU		*Senecio psilocarpus*	Swamp Fireweed	N/A	N/A	Low
PMST	EN	En	*Thelymitra epipactoides*	Metallic Sun-orchid	N/A	N/A	Low
PMST	VU	En	*Thelymitra matthewsii*	Spiral Sun-orchid	N/A	N/A	Low
PMST		Cr	*Thelymitra orientalis*	Slender Plum-orchid	N/A	N/A	Low
PMST	VU	Cr	*Xerochrysum palustre*	Swamp Everlasting	N/A	N/A	Low

* **Listing Status Key:**

EPBC Act: **EX** = Extinct; **CR** = Critically endangered; **EN** = Endangered; **VU** = Vulnerable; and **CD** = Conservation dependant.

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Appendix 3. Likelihood of Occurrence: Listed Fauna

^ Listing Status Key

EPBC Act Listing Status
EX: Extinct; **CR**: Critically endangered; **EN**: Endangered; **VU**: Vulnerable; and **CD**: Conservation dependant.

FFG Act Listing Status
ex: Extinct; **rx**: Regionally Extinct; **wx**: Extinct in the Wild; **cr**: Critically Endangered; **en**: Endangered; **vu**: Vulnerable; **th**: Threatened; **nt**: Near Threatened; and **dd**: Data Deficient.

International Treaty Listing
B: Bonn Convention; **C:** CAMBA; **J**: JAMBA; **R**: ROKAMBA (China-; Japan; and Republic of Korea- Australia Migratory Bird Agreement.

Source	Listing Status ^			Scientific Name	Common Name	Individuals Recorded	Last Record	Likelihood Of Occurrence
	Treaty	EPBC	FFG					
V B A			En	*Accipiter novaehollandiae*	Grey Goshawk	4	1993	Low
VBA	B,R,J,C		Vu	*Actitis hypoleucos*	Common Sandpiper	4	2018	Low-moderate
VBA			Vu	*Anseranas semipalmata*	Magpie Goose	5080	2019	**High**
PMST		VU	Vu	*Antechinus minimus maritimus*	Swamp Antechinus	N/A	N/A	Low
VBA	C,J		Vu	*Ardea alba modesta*	Eastern Great Egret	20	2019	**High**
VBA			Cr	*Ardea intermedia plumifera*	Plumed Egret	1	1999	**High**
VBA			Cr	*Ardeotis australis*	Australian Bustard	2	2018	Low-moderate
VBA or PMST	B,R,J,C	VU	En	*Arenaria interpres*	Ruddy Turnstone	85	2000	Low
VBA			Vu	*Biziura lobata*	Musk Duck	23	2018	**Moderate-high**
VBA or PMST		EN	Cr	*Botaurus poiciloptilus*	Australasian Bittern	5	2019	Low-moderate
VBA or PMST	B,R,J,C	VU		*Calidris acuminata*	Sharp-tailed Sandpiper	327	2000	Low
VBA	B,R,J,C			*Calidris alba*	Sanderling	13	2022	Low
PMST	B,R,J,C	VU	En	*Calidris canutus*	Red Knot	N/A	N/A	Low
VBA or PMST	B,R,J,C	CR	Cr	*Calidris ferruginea*	Curlew Sandpiper	1	1992	Low
VBA	B,R,J,C			*Calidris ruficollis*	Red-necked Stint	16	2019	Low
VBA	B,R,J,C			*Calidris subminuta*	Long-toed Stint	1	1991	Low-moderate
VBA or PMST		EN	En	*Callocephalon fimbriatum*	Gang-gang Cockatoo	1	2000	Low
VBA	B			*Charadrius bicinctus*	Double-banded Plover	45	2010	Low
PMST	B,R,J,C	VU	Vu	*Charadrius leschenaultii*	Greater Sand Plover	N/A	N/A	Low
PMST	B,R,J,C	EN	En	*Charadrius mongolus*	Lesser Sand Plover	N/A	N/A	Low
VBA	C,R,J			*Chlidonias leucopterus*	White-winged Black Tern	9	2008	Low
PMST		VU		*Climacteris picumnus victoriae*	Brown Treecreeper	N/A	N/A	Low

Source	Listing Status ^			Scientific Name	Common Name	Individuals Recorded	Last Record	Likelihood Of Occurrence
	Treaty	EPBC	FFG					
PMST		EN	En	*Dasyurus maculatus maculatus*	Spot-tailed Quoll	N/A	N/A	Low
PMST		VU	En	*Delma impar*	Striped Legless Lizard	N/A	N/A	Low
VBA			En	*Egretta garzetta*	Little Egret	2	2018	**Moderate**
VBA			Vu	*Engaeus sericatus*	Hairy Burrowing Crayfish	4	2008	**Moderate**
VBA			Th	*Euastacus armatus*	Murray Spiny Crayfish	1	2014	**High**
PMST		VU	Vu	*Falco hypoleucos*	Grey Falcon	N/A	N/A	Low
VBA or PMST	B,R,J,C	VU		*Gallinago hardwickii*	Latham's Snipe	69	2023	Low-moderate
PMST		VU	Vu	*Grantiella picta*	Painted Honeyeater	N/A	N/A	Low
VBA	C		En	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	1	2000	**Moderate-high**
VBA			Vu	*Hieraaetus morphnoides*	Little Eagle	3	2005	**Moderate**
PMST	C,R,J	VU	Vu	*Hirundapus caudacutus*	White-throated Needletail	N/A	N/A	**Moderate-high**
VBA	C,J		Vu	*Hydroprogne caspia*	Caspian Tern	11	2000	Low
PMST		EN	En	*Isoodon obesulus obesulus*	Southern Brown Bandicoot	N/A	N/A	Low
VBA			En	*Ixobrychus dubius*	Australian Little Bittern	2	1995	Low-moderate
PMST		CR	Cr	*Lathamus discolor*	Swift Parrot	N/A	N/A	Low
VBA			Vu	*Lewinia pectoralis*	Lewin's Rail	4	1999	Low-moderate
VBA or PMST	B,R,J,C	VU	Vu	*Limosa lapponica*	Bar-tailed Godwit	10	1999	Low
VBA	B,R,J,C	EN	Cr	*Limosa limosa*	Black-tailed Godwit	1	1999	Low
VBA or PMST		EN	En	*Lissolepis coventryi*	Swamp Skink	23	2018	**Moderate**
PMST		VU	Vu	*Litoria raniformis*	Growling Grass Frog	N/A	N/A	Low
PMST		CR	Cr	*Miniopterus orianae bassanii*	Southern Bent-winged Bat	N/A	N/A	Low
VBA		EN	Vu	*Nannoperca obscura*	Yarra Pygmy Perch	53	2017	**High**
VBA		CR	Cr	*Neophema chrysogaster*	Orange-bellied Parrot	3	1987	Low
VBA		VU		*Neophema chrysostoma*	Blue-winged Parrot	1	2000	Low-moderate
PMST	B,R,J,C	CR	Cr	*Numenius madagascariensis*	Eastern Curlew	N/A	N/A	Low
VBA			Vu	*Ornithorhynchus anatinus*	Platypus	20	2022	**High**
VBA			Vu	*Oxyura australis*	Blue-billed Duck	4	2018	**Moderate**
PMST		VU		*Pachyptila turtur subantarctica*	Fairy Prion	N/A	N/A	Low
PMST		VU	Vu	*Petaurus australis*	Yellow-bellied Glider	N/A	N/A	Low
VBA	B,C			*Plegadis falcinellus*	Glossy Ibis	68	2019	**Moderate**
PMST		VU	Vu	*Potorous tridactylus trisulcatus*	Long-nosed Potoroo	N/A	N/A	Low

Source	Listing Status ^			Scientific Name	Common Name	Individuals Recorded	Last Record	Likelihood Of Occurrence
	Treaty	EPBC	FFG					
VBA		VU	En	*Prototroctes maraena*	Australian Grayling	1	2024	Low-moderate
PMST		VU	En	*Pseudomys novaehollandiae*	New Holland Mouse	N/A	N/A	Low
VBA		VU	Vu	*Pteropus poliocephalus*	Grey-headed Flying-fox	3329	2022	**Moderate**
PMST	C	EN	Cr	*Rostratula australis*	Australian Painted-snipe	N/A	N/A	Low
VBA			Vu	*Spatula rhynchotis*	Australasian Shoveler	329	2019	**Moderate**
PMST		VU	Vu	*Stagonopleura guttata*	Diamond Firetail	N/A	N/A	Low
VBA	C,R,J			*Sterna hirundo*	Common Tern	51	2020	Low
VBA	B,R,J,C		Cr	*Sternula albifrons*	Little Tern	5	2017	Low
VBA		VU	Cr	*Sternula nereis*	Fairy Tern	2	2017	Low
VBA			En	*Stictonetta naevosa*	Freckled Duck	7	2018	**Moderate**
PMST		VU	Vu	*Synemon plana*	Golden Sun Moth	N/A	N/A	Low
VBA		VU	Vu	*Thinornis cucullatus*	Hooded Plover	132	2022	Low
VBA	B,R,J,C		En	*Tringa glareola*	Wood Sandpiper	2	2019	Low
VBA	B,R,J,C	EN	En	*Tringa nebularia*	Common Greenshank	110	2001	Low
VBA	B,R,J,C		En	*Tringa stagnatilis*	Marsh Sandpiper	5	1994	Low

* **Listing Status Key:**

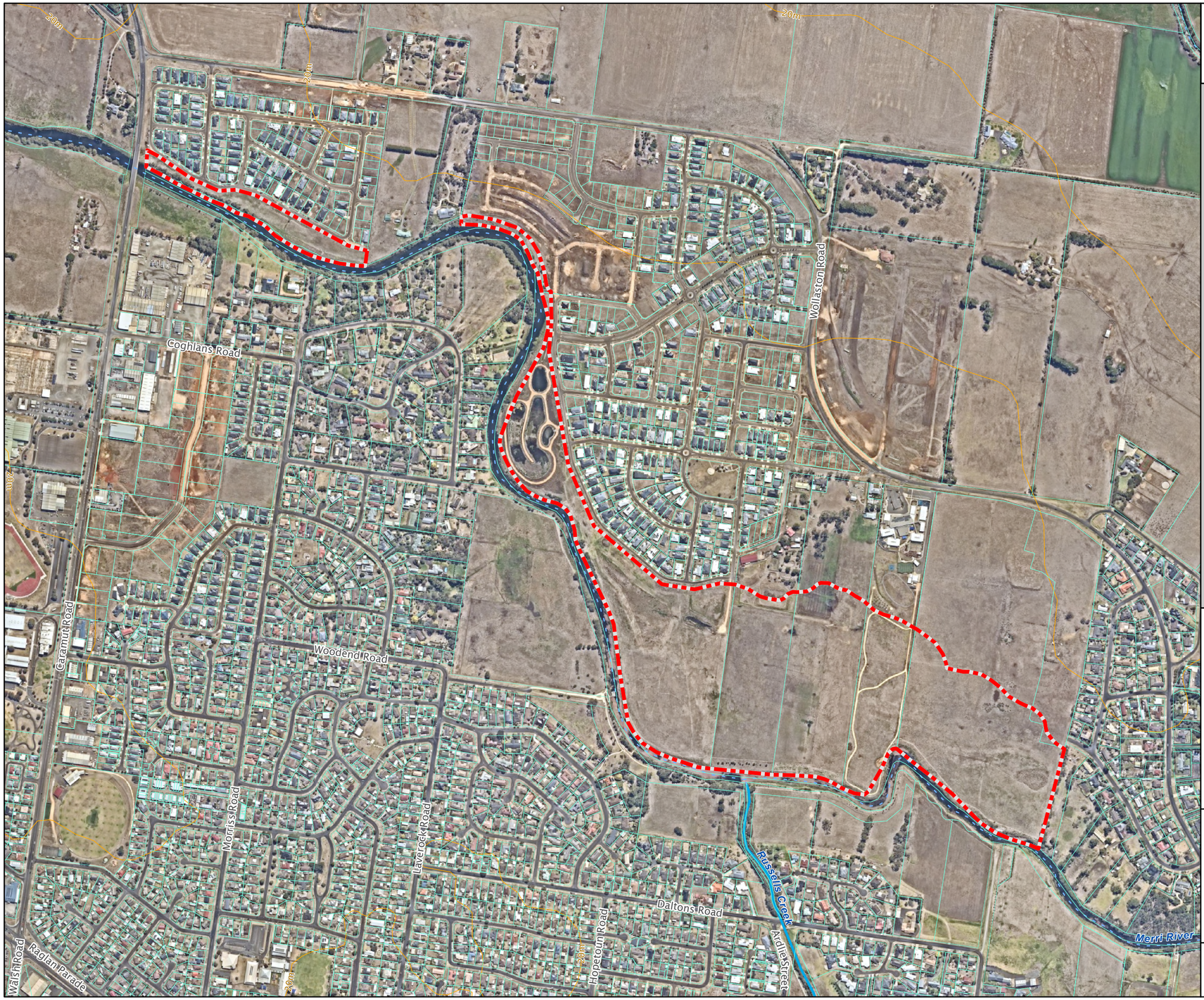
Treaty: **B** = Bonn Convention; and **C**, **J** ,and **R** = China-, Japan-, and Republic of Korea-Australia Migratory Bird Agreements.

EPBC Act: **EX** = Extinct; **CR** = Critically endangered; **EN** = Endangered; **VU** = Vulnerable; and **CD** = Conservation dependant.

FFG Act: **ex** = Extinct; **rx** = Regionally Extinct; **wx** = Extinct in the Wild; **cr** = Critically Endangered; **en** = Endangered; **vu** = Vulnerable; **th** = Threatened **nt** = Near Threatened; and **dd** = Data Deficient.

Appendix 4. Maps

Maps start on the next page.



Map 1. Study Area

North Merri Open Space, Warrnambool VIC

Legend

- Study area
- Parcel boundary

Topography

- Contour (20m interval)
- River
- Connector

Details

Mapping by: Nina Matheis
Date: 17/04/2025
Aerial imagery: Nearmap (08/03/2025)
Basemap data: Vicmap Basemap © State Government of Victoria

N

0 100 200 m

Scale: 1:8,000
(Page size A3)

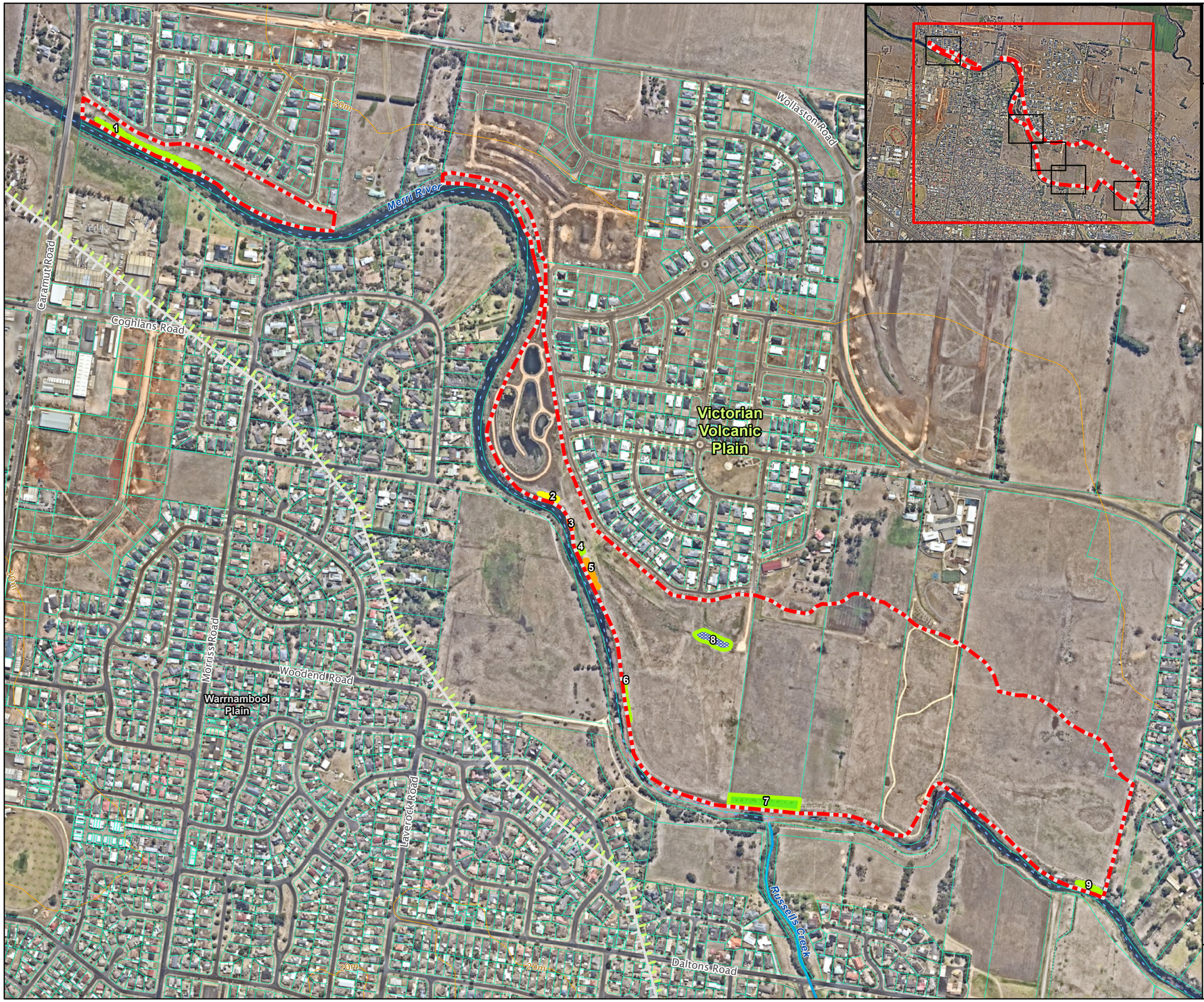
GDA 1994 MGA Zone 54

PRACTICAL ECOLOGY
ecological restoration & consulting

p: (03) 9484 1555 e: enquiries@practicalecology.com.au

Map 2. Existing Conditions

North Merri Open Space, Warrnambool VIC



Legend

- Study area
- Parcel boundary

Native vegetation patch

EVC - Quality

- N/A - Low quality
- N/A - Low to moderate quality
- Swamp Scrub (VVP_0053) - Low quality
- Swamp Scrub (VVP_0053) - Moderate quality
- Tall Marsh (VVP_0821) - Low quality
- Tall Marsh (VVP_0821) - Moderate quality

Bioregion

- Victorian Volcanic Plain
- Warrnambool Plain

Topography

- Contour (20m interval)

Hydrology

- River
- Connector

Details

Mapping by: Nina Matheis
Date: 17/04/2025
Aerial imagery: Nearmap (08/03/2025)
Basemap data: Vicmap Basemap © State Government of Victoria

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Scale: 1:7,000
(Page size A3)

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Map 2. Existing Conditions

North Merri Open Space, Warrnambool VIC

Legend

- Study area
- Parcel boundary

Native vegetation patch

EVC - Quality

- N/A - Low quality

Hydrology

- Connector

Details

Mapping by: Nina Matheis
Date: 17/04/2025
Aerial imagery: Nearmap (08/03/2025)
Basemap data: Vicmap Basemap © State Government of Victoria

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Scale: 1:1,000
(Page size A3)

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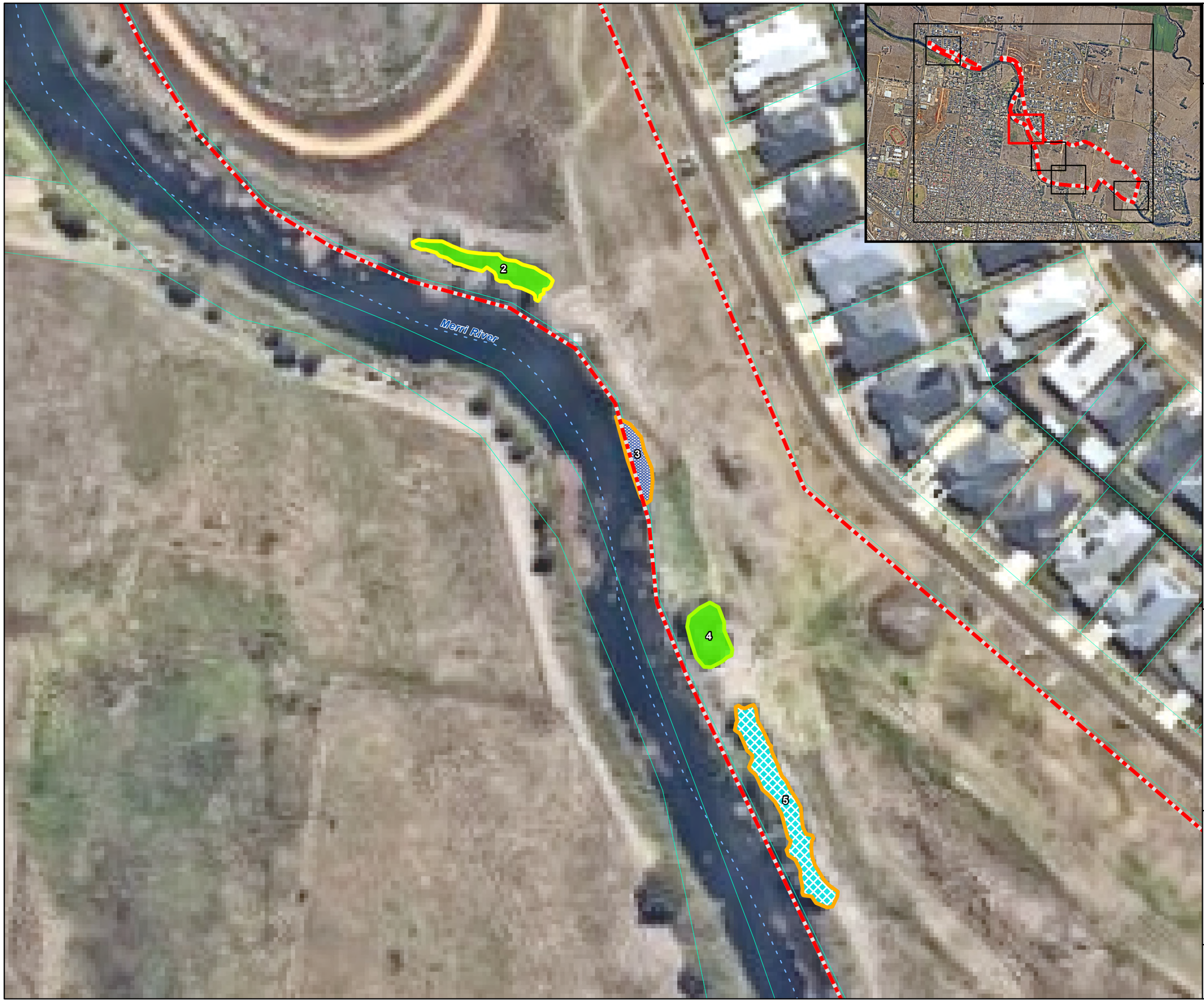

Map 2. Existing Conditions

North Merri Open Space, Warrnambool VIC

Legend

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- Parcel boundary

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- Tall Marsh (VVP_0821) - Moderate quality

Hydrology

- Connector

Details

Mapping by: Nina Matheis
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Aerial imagery: Nearmap (08/03/2025)
Basemap data: Vicmap Basemap © State Government of Victoria

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(Page size A3)

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Map 2. Existing Conditions

North Merri Open Space, Warrnambool VIC

Legend

Study area

Parcel boundary

Native vegetation patch

EVC - Quality

N/A - Low quality

Tall Marsh (VVP_0821) - Low quality

Hydrology

Connector

Details

Mapping by: Nina Matheis
Date: 17/04/2025
Aerial imagery: Nearmap (08/03/2025)
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(Page size A3)

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Map 2. Existing Conditions

North Merri Open Space, Warrnambool VIC

Legend

Study area

Parcel boundary

Native vegetation patch

EVC - Quality

N/A - Low quality

Hydrology

River

Connector

Details

Mapping by: Nina Matheis
Date: 17/04/2025
Aerial imagery: Nearmap (08/03/2025)
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Scale: 1:1,000
(Page size A3)

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Map 2. Existing Conditions

North Merri Open Space, Warrnambool VIC

Legend

Study area

Parcel boundary

Native vegetation patch

EVC - Quality

Swamp Scrub (VVP_0053) - Low quality

Hydrology

Connector

Details

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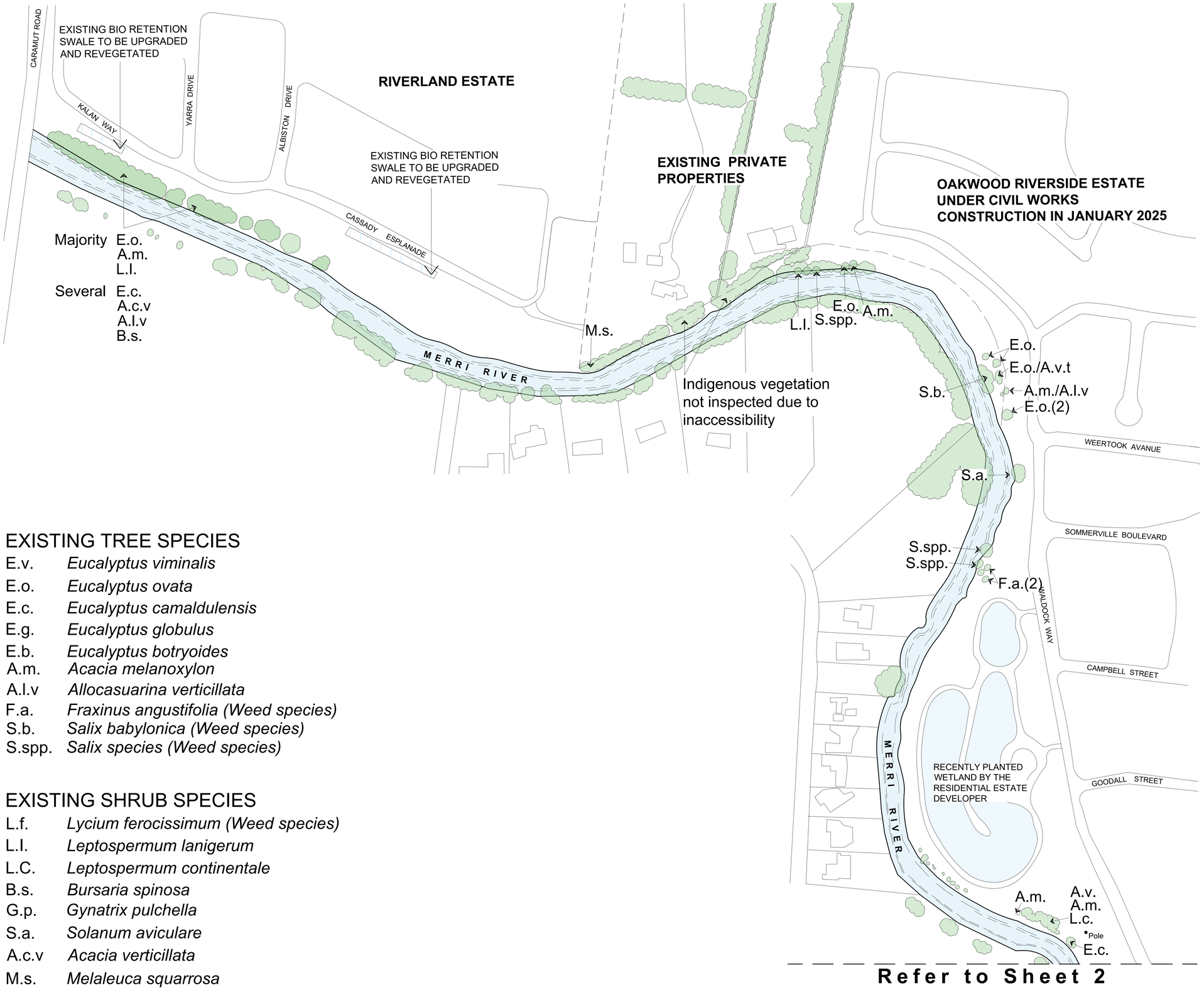

EXISTING TREE SPECIES

E.v.	*Eucalyptus viminalis*
E.o.	*Eucalyptus ovata*
E.c.	*Eucalyptus camaldulensis*
E.g.	*Eucalyptus globulus*
E.b.	*Eucalyptus botryoides*
A.m.	*Acacia melanoxylon*
A.l.v	*Allocasuarina verticillata*
F.a.	*Fraxinus angustifolia (Weed species)*
S.b.	*Salix babylonica (Weed species)*
S.spp.	*Salix species (Weed species)*

EXISTING SHRUB SPECIES

L.f.	*Lycium ferocissimum (Weed species)*
L.I.	*Leptospermum lanigerum*
L.C.	*Leptospermum continentale*
B.s.	*Bursaria spinosa*
G.p.	*Gynatrix pulchella*
S.a.	*Solanum aviculare*
A.c.v	*Acacia verticillata*
M.s.	*Melaleuca squarrosa*

EXISTING TREES AND LARGE SHRUBS SPECIES PLAN - SHEET 1

NORTH MERRI OPEN SPACE

WARRNAMBOOL CITY COUNCIL

0 10 20 30 40 50 100M

SCALE 1:1500 (B1 SHEET)

Title: Existing Trees and Large Shrubs Species Plan - Sheet 1

Client: Warrnambool City Council

MICHAEL SMITH AND ASSOCIATES
Landscape Architecture and Urban Design

Office: 1st floor, 407 Whitehorse Road, Balwyn VIC 3103
Postal: 5 Jervis Street, Camberwell VIC 3124
Tel: 9830 0414
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Email: mike@msalandurb.com.au

In conjunction with the following subconsultant:
Practical Ecology
Office: 2B Stott Street, Preston VIC 3072
Tel: 9484 1555

Drawn: AL/SP
Date: 11.06.2025
Project No.: 25-014
Cad File:
Drawing No.: Sheet 1 of 7

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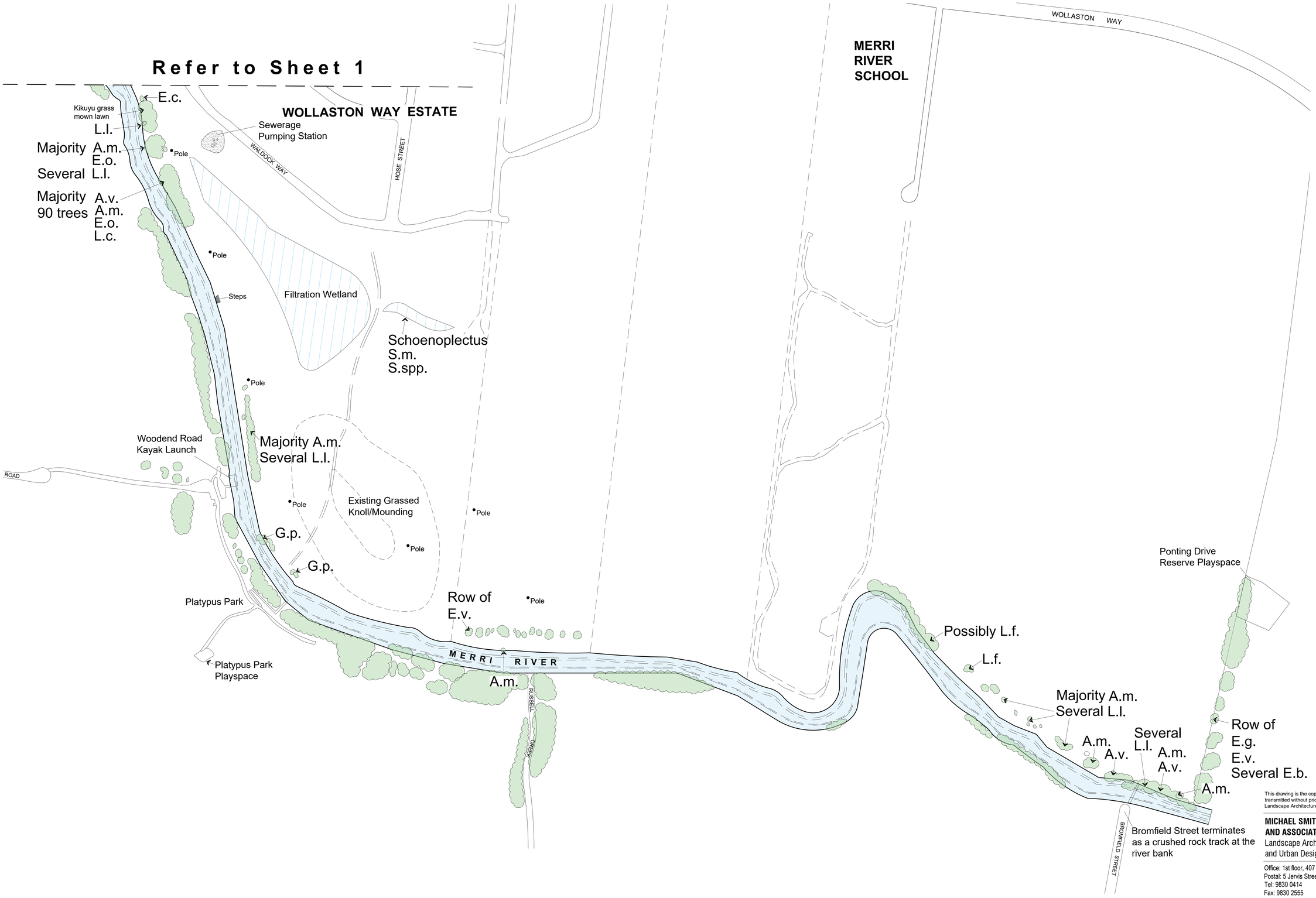

EXISTING TREES AND LARGE SHRUBS SPECIES PLAN - SHEET 2

NORTH MERRI OPEN SPACE

WARRNAMBOOL CITY COUNCIL

0 10 20 30 40 50 100M

SCALE 1:1500 (B1 SHEET)

Title: Existing Trees and Large Shrubs Species Plan - Sheet 2

Client: Warrnambool City Council

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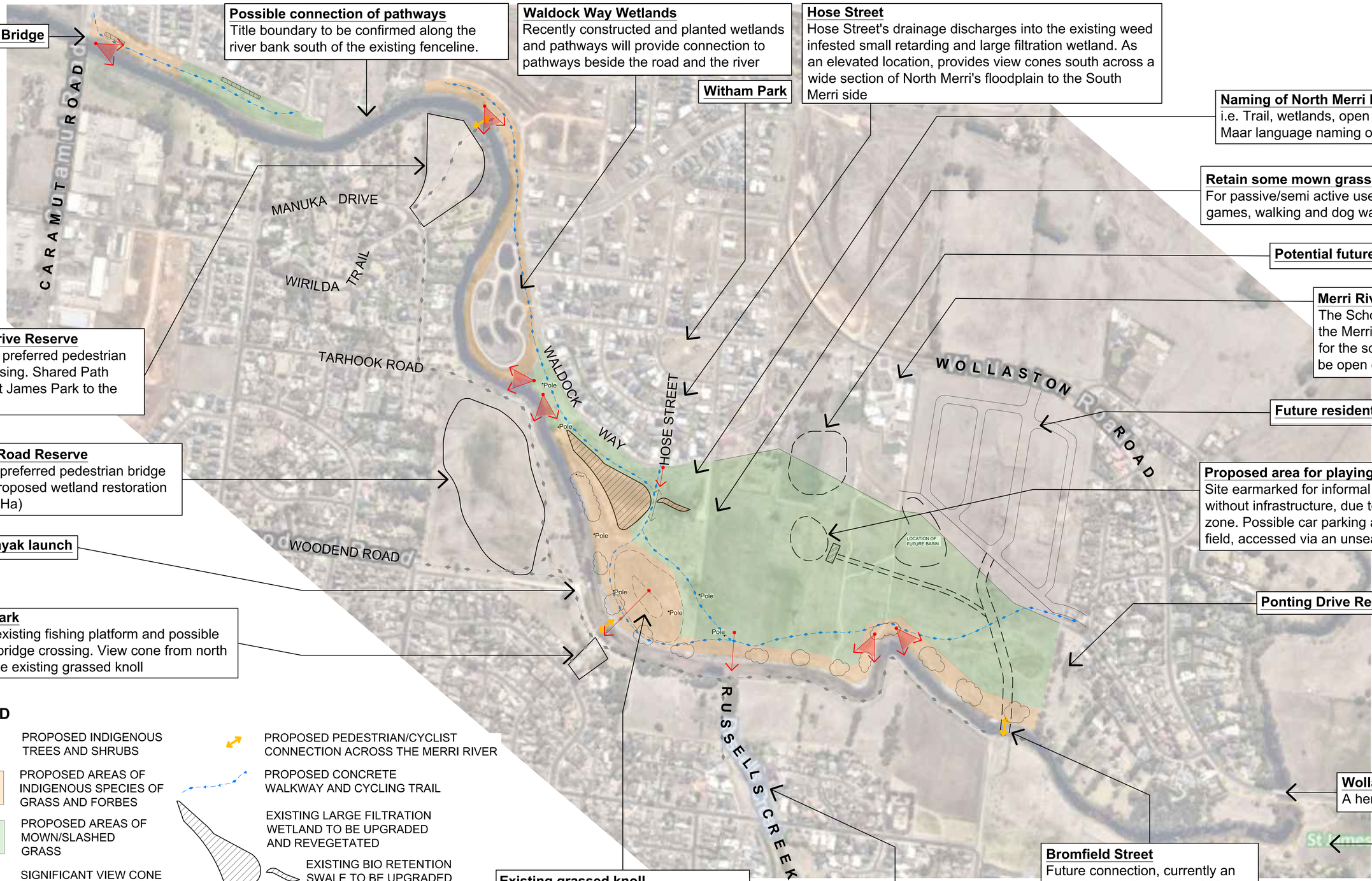
Cad File:
Drawing No.: Sheet 2 of 7



Cassady's Bridge

Possible connection of pathways
Title boundary to be confirmed along the river bank south of the existing fenceline.

Waldock Way Wetlands
Recently constructed and planted wetlands and pathways will provide connection to pathways beside the road and the river

Witham Park

Hose Street
Hose Street's drainage discharges into the existing weed infested small retarding and large filtration wetland. As an elevated location, provides view cones south across a wide section of North Merri's floodplain to the South Merri side

Naming of North Merri Elements
i.e. Trail, wetlands, open space. Discuss Maar language naming options with EMAC

Retain some mown grass
For passive/semi active use, including ball games, walking and dog walking

Potential future school site

Merri River School
The School has access to the Merri River. Potential for the school grounds to be open out of hours

Future residential subdivision

Proposed area for playing fields
Site earmarked for informal recreational fields without infrastructure, due to the flood plain zone. Possible car parking area at the playing field, accessed via an unsealed road

Ponting Drive Reserve Playspace

Wollaston Bridge
A heritage listed bridge

St James Park

Manuka Drive Reserve
Merri River preferred pedestrian bridge crossing. Shared Path linking to St James Park to the southeast

Woodend Road Reserve
Merri River preferred pedestrian bridge crossing. Proposed wetland restoration (Approx. 12Ha)

Existing kayak launch

Platypus Park
Site of the existing fishing platform and possible pedestrian bridge crossing. View cone from north bank and the existing grassed knoll

Existing grassed knoll
Provides a view cone along part of the Merri River and a sense of isolation from the recent Riverside Estate residential subdivision. A place for solitude and contemplation

Russells Creek Reserve
Improved pedestrian safety upgrades linking surrounding roads, as per the South Merri Precinct Plan. Pathway link to the Botanic Gardens and the City Centre

Bromfield Street
Future connection, currently an unmade road for the last 200 metres north of Daltons Road

LEGEND

- PROPOSED INDIGENOUS TREES AND SHRUBS
- PROPOSED AREAS OF INDIGENOUS SPECIES OF GRASS AND FORBES
- PROPOSED AREAS OF MOWN/SLASHED GRASS
- SIGNIFICANT VIEW CONE
- PEDESTRIAN AND VEHICLE ACCESS
- •Pole — EXISTING POWER POLE SCHEDULED FOR REMOVAL
- PROPOSED SOUTH OF MERRI SHARED PATH AND CONNECTION TO NORTH MERRI
- PROPOSED PEDESTRIAN/CYCLIST CONNECTION ACROSS THE MERRI RIVER
- PROPOSED CONCRETE WALKWAY AND CYCLING TRAIL
- EXISTING LARGE FILTRATION WETLAND TO BE UPGRADED AND REVEGETATED
- EXISTING BIO RETENTION SWALE TO BE UPGRADED AND REVEGETATED
- PROPOSED SEALED VEHICLE ACCESS FROM BROMFIELD STREET
- PROPOSED UNSEALED VEHICLE ACCESS FROM BROMFIELD STREET

KEY STRATEGIES PLAN
NORTH MERRI OPEN SPACE
WARRNAMBOOL CITY COUNCIL

0 20 40 60 80 100 200M
SCALE 1:3500 (B1 SHEET)

Title: Key Strategies Plan

Client: Warrnambool City Council

MICHAEL SMITH AND ASSOCIATES
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Tel: 9484 1555

Drawn: JJ/SP
Date: 17.06.2025
Project No.: 25-014
Cad File:
Drawing No.: Sheet 3 of 7

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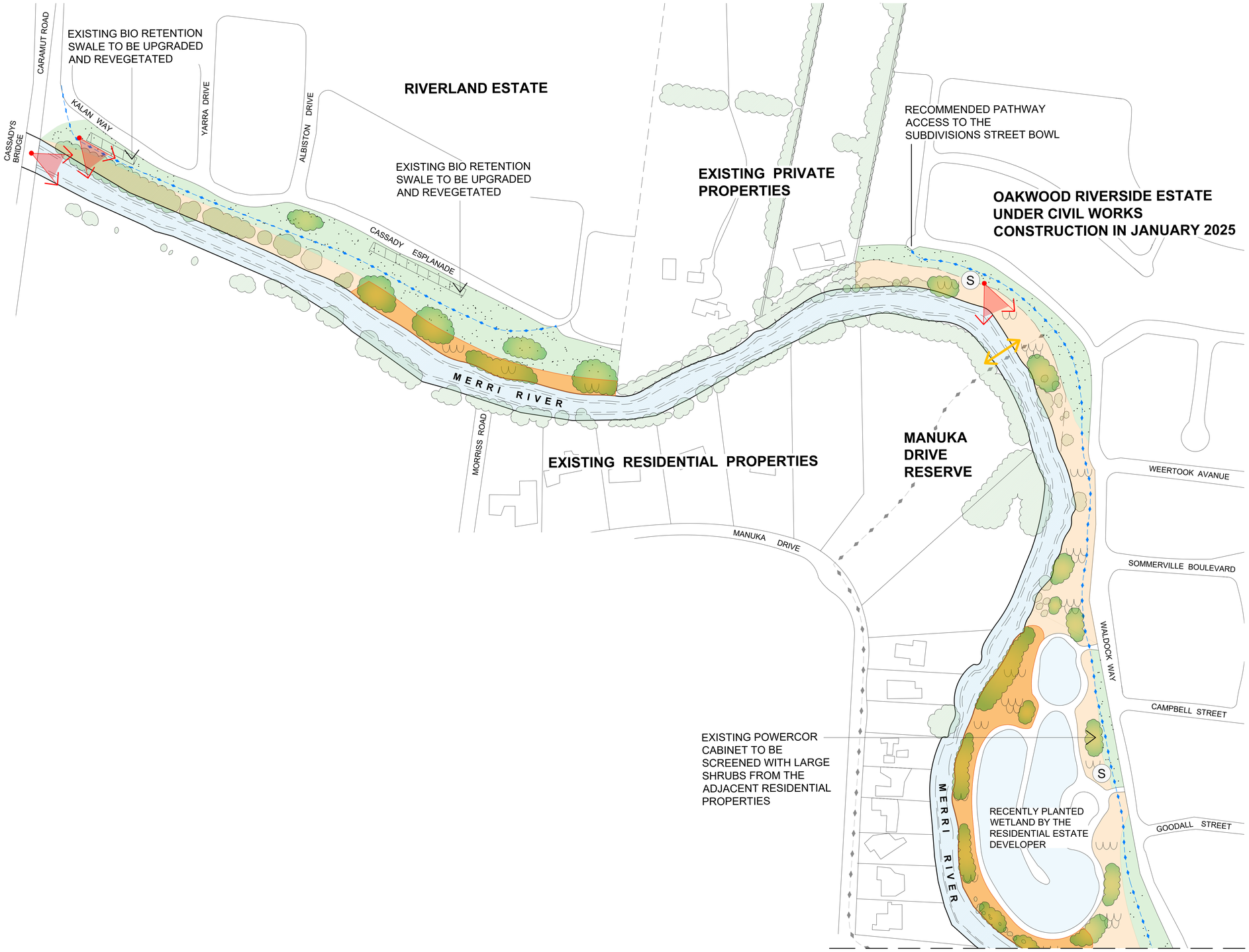

Refer to Sheet 2

LEGEND

- EXISTING VEGETATION TO BE RETAINED AND MAINTAINED BY COUNCIL
- EXISTING GRASSED AREAS TO BE RETAINED AND MAINTAINED IN LINE WITH COUNCIL'S AVAILABLE OPERATION BUDGET
- PROPOSED HIGH PRIORITY AREAS OF INDIGENOUS SPECIES OF GRASS AND FORBES TO BE MAINTAINED BY COUNCIL AS KEY HABITAT AND BIODIVERSITY ZONES
- PROPOSED AREAS OF INDIGENOUS SPECIES OF GRASS AND FORBES TO BE MAINTAINED BY COUNCIL, IF AN ONGOING MAINTENANCE BUDGET ALLOWS FOR. ALTERNATIVELY, EXISTING AREAS OF MOWN/SLASHED GRASS TO BE RETAINED AND MAINTAINED BY COUNCIL
- PROPOSED GROUP OF 5-10 INDIGENOUS OR NATIVE TREES. A MAXIMUM OF 10-15 TREES TO BE PLANTED PER HECTARE, AS PER THE GHCMA GUIDELINES
- SIGNIFICANT VIEW CONE
- PROPOSED REINFORCED CONCRETE SHARED TRAIL
- PROPOSED SOUTH OF MERRI SHARED PATH AND CONNECTION TO NORTH MERRI
- PROPOSED PEDESTRIAN/CYCLIST CONNECTION ACROSS THE MERRI RIVER
- S PROPOSED LOCATION FOR A SEAT
- 1 HECTARE AREA SHOWN AS A GUIDE

MICHAEL SMITH AND ASSOCIATES
Landscape Architecture and Urban Design

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In conjunction with the following subconsultant:
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Office: 2B Stott Street, Preston VIC 3072
Tel: 9484 1555

PROPOSED PLANTING PLAN - SHEET 1
NORTH MERRI OPEN SPACE
WARRNAMBOOL CITY COUNCIL

0 10 20 30 40 50 100M
SCALE 1:1500 (B1 SHEET)

Title: Proposed Planting Plan - Sheet 1

Client: Warrnambool City Council

Drawn: AL/SP
Date: 17.06.2025
Project No.: 25-014
Cad File:
Drawing No.: Sheet 4 of 7

N

PROPOSED PLANTING PLAN - SHEET 2

NORTH MERRI OPEN SPACE

WARRNAMBOOL CITY COUNCIL

0 10 20 30 40 50 100M

SCALE 1:1500 (B1 SHEET)

Title: Proposed Planting Plan - Sheet 2

Client: Warrnambool City Council

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Landscape Architecture and Urban Design

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Practical Ecology
Office: 2B Stott Street, Preston VIC 3072
Tel: 9484 1555

Drawn: AL/SP
Date: 17.06.2025
Project No.: 25-014
Cad File:
Drawing No.: Sheet 5 of 7

N

PROPOSED PLANT SCHEDULE

LIFEFORM	KEY	BOTANIC NAME	COMMON NAME
PLANTING REGIME A - EMBANKMENT STRIP			
MEDIUM TO LARGE TREES (>8 m)		*Acacia mearnsii*	BLACK WATTLE
MEDIUM TO LARGE TREES (>8 m)		*Acacia melanoxylon*	BLACKWOOD
MEDIUM TO LARGE TREES (>8 m)		*Allocasuarina verticillata*	DROOPING SHEOAK
MEDIUM TO LARGE TREES (>8 m)		*Eucalyptus ovata*	SWAMP GUM
MEDIUM TO LARGE TREES (>8 m)		*Eucalyptus viminalis subsp. viminalis*	MANNA GUM
LARGE SHRUBS AND SMALL TREES (2-8 m)		*Acacia paradoxa*	HEDGE WATTLE
LARGE SHRUBS AND SMALL TREES (2-8 m)		*Acacia pycnantha*	GOLDEN WATTLE
LARGE SHRUBS AND SMALL TREES (2-8 m)		*Acacia verticillata*	PRICKLY MOSES
LARGE SHRUBS AND SMALL TREES (2-8 m)		*Bursaria spinosa*	SWEET BURSARIA
LARGE SHRUBS AND SMALL TREES (2-8 m)		*Leptospermum lanigerum*	WOOLLY TEA-TREE
LARGE SHRUBS AND SMALL TREES (2-8 m)		*Melaleuca squarrosa*	SCENTED PAPERBARK
LARGE SHRUBS AND SMALL TREES (2-8 m)		*Melicytus dentatus*	TREE VIOLET
LARGE SHRUBS AND SMALL TREES (2-8 m)		*Ozothamnus ferrugineus*	TREE EVERLASTING
MEDIUM SHRUBS(1-2 m)		*Acacia myrtifolia*	MYRTLE WATTLE
MEDIUM SHRUBS(1-2 m)		*Coprosma quadrifida*	PRICKLY CURRANT-BUSH
MEDIUM SHRUBS (1-2 m)		*Leptospermum scoparium*	MANUKA
SMALL SHRUBS/PROSTRATE SHRUBS (<1 m)		*Bossiaea prostrata*	CREEPING BOSSIAEA
SMALL SHRUBS/PROSTRATE SHRUBS (<1 m)		*Styphelia humifusa*	CRANBERRY HEATH
GRAMINOIDS (<1 m)		*Carex appressa*	TALL SEDGE
GRAMINOIDS (<1 m)		*Dianella admixta*	BLACK-ANTHER FLAX-LILY
GRAMINOIDS (<1 m)		*Gahnia sieberiana*	RED-FRUIT SAW-SEDGE
GRAMINOIDS (<1 m)		*Lomandra longifolia*	SPINY-HEADED MAT-RUSH
GRAMINOIDS (<1 m)		*Microlaena stipoides* var. *stipoides*	WEEPING GRASS
GRAMINOIDS (<1 m)		*Phragmites australis*	COMMON REED
GRAMINOIDS (<1 m)		*Poa labillardierei*	COMMON TUSSOCK-GRASS
GRAMINOIDS (<1 m)		*Rytidosperma racemosum* var. *racemosum*	STIPED WALLABY-GRASS
FORBS (<1 m)		*Acaena novae-zelandiae*	BIDGEE-WIDGEE
FORBS (<1 m)		*Dichondra repens*	KIDNEY WEED
FORBS (<1 m)		*Oxalis perennans*	GRASSLAND WOOD-SORREL
FORBS (<1 m)		*Persicaria decipiens*	SLENDER KNOTWEED
PLANTING REGIME B - EXISTING INDIGENOUS TREE AND SHRUB AREAS			
MEDIUM SHRUBS(1-2 m)		*Acacia myrtifolia*	MYRTLE WATTLE
MEDIUM SHRUBS(1-2 m)		*Coprosma quadrifida*	PRICKLY CURRANT-BUSH
MEDIUM SHRUBS (1-2 m)		*Leptospermum scoparium*	MANUKA
SMALL SHRUBS/PROSTRATE SHRUBS (<1 m)		*Styphelia humifusa*	CRANBERRY HEATH
GRAMINOIDS (<1 m)		*Poa labillardierei*	COMMON TUSSOCK-GRASS
GRAMINOIDS (<1 m)		*Rytidosperma racemosum* var. *racemosum*	STIPED WALLABY-GRASS
GRAMINOIDS (<1 m)		*Rytidosperma setaceum*	BRISTLY WALLABY-GRASS

LIFEFORM	KEY	BOTANIC NAME	COMMON NAME
PLANTING REGIME C - INDIGENOUS GRASSES AND FORBS			
SMALL SHRUBS/PROSTRATE SHRUBS (<1 m)		*Bossiaea prostrata*	CREEPING BOSSIAEA
GRAMINOIDS (<1 m)		*Austrostipa mollis*	SUPPLE SPEAR-GRASS
GRAMINOIDS (<1 m)		*Dianella admixta*	BLACK-ANTHER FLAX-LILY
GRAMINOIDS (<1 m)		*Microlaena stipoides* var. *stipoides*	WEEPING GRASS
GRAMINOIDS (<1 m)		*Poa rodwayi*	VELVET TUSSOCK-GRASS
GRAMINOIDS (<1 m)		*Rytidosperma racemosum* var. *racemosum*	STIPED WALLABY-GRASS
GRAMINOIDS (<1 m)		*Rytidosperma setaceum*	BRISTLY WALLABY-GRASS
GRAMINOIDS (<1 m)		*Themeda triandra*	KANGAROO GRASS
FORBS (<1 m)		*Acaena novae-zelandiae*	BIDGEE-WIDGEE
FORBS (<1 m)		*Dichondra repens*	KIDNEY WEED
FORBS (<1 m)		*Oxalis perennans*	GRASSLAND WOOD-SORREL
PLANTING REGIME D, E, F - WETLAND PLANTING			
LARGE SHRUBS AND SMALL TREES (2-8 m)		*Leptospermum lanigerum*	WOOLLY TEA-TREE
LARGE SHRUBS AND SMALL TREES (2-8 m)		*Melaleuca squarrosa*	SCENTED PAPERBARK
MEDIUM SHRUBS (1-2 m)		*Leptospermum scoparium*	MANUKA
GRAMINOIDS (<1 m)		*Baumea articulata*	JOINTED TWIG-SEDGE
GRAMINOIDS (<1 m)		*Carex appressa*	TALL SEDGE
GRAMINOIDS (<1 m)		*Ficinia nodosa*	KNOBBY CLUB-RUSH
GRAMINOIDS (<1 m)		*Juncus flavidus*	YELLOW RUSH
GRAMINOIDS (<1 m)		*Juncus pallidus*	PALE RUSH
GRAMINOIDS (<1 m)		*Lomandra longifolia*	SPINY-HEADED MAT-RUSH
GRAMINOIDS (<1 m)		*Poa labillardierei*	COMMON TUSSOCK-GRASS
FORBS (<1 m)		*Dichondra repens*	KIDNEY WEED
FORBS (<1 m)		*Persicaria decipiens*	SLENDER KNOTWEED
PLANTING REGIME G - SCATTERED INDIGENOUS TREE PLANTING			
MEDIUM TO LARGE TREES (>8 m)		*Acacia melanoxylon*	BLACKWOOD
MEDIUM TO LARGE TREES (>8 m)		*Allocasuarina verticillata*	DROOPING SHEOAK
MEDIUM TO LARGE TREES (>8 m)		*Eucalyptus ovata*	SWAMP GUM
MEDIUM TO LARGE TREES (>8 m)		*Eucalyptus viminalis* subsp. *viminalis*	MANNA GUM

PROPOSED PLANT QUANTITIES AND COSTS

REGIME	QUANTITY OF PLANTS	TOTAL COST OF INCEPTION WEED CONTROL AND PLANTING WORKS	MAINTENACE PER ANNUM FROM PLANTING INCEPTION UNTIL YEAR TWO	MAINTENACE PER ANNUM FROM YEAR THREE UNTIL YEAR FIVE	MAINTENACE PER ANNUM FROM YEAR SIX AND BEYOND
PLANTING REGIME A **OPTION A** - EMBANKMENT STRIP	32500	$221,565	$12,020	$4,808	$1,202
PLANTING REGIME A **OPTION B** - EMBANKMENT STRIP	87500	$596,665	$47,080	$18,832	$4,708
PLANTING REGIME B - EXISTING INDIGENOUS TREE AND SHRUB AREAS	9000	$56,290	$16,360	$6,544	$1,636
PLANTING REGIME C **OPTION A** - INDIGENOUS GRASSES AND FORBES	180 AND 9kg OF DIRECT SEEDING	$7,015	$12,270	$4,908	$1,227
PLANTING REGIME C **OPTION B** - INDIGENOUS GRASSES AND FORBES	500 AND 26kg OF DIRECT SEEDING	$20,125	$33,220	$13,288	$3,322
PLANTING REGIME D - LARGE FILTRATION WETLAND PLANTING	5725	$27,703	$16,360	$6,544	$1,636
PLANTING REGIME E - EXISTING RETARDING BASIN PLANTING	1280	$6,450	$1,210	$484	$121
PLANTING REGIME F - EXISTING BIO RETENTION SWALE PLANTING	1920	$9,675	$1,815	$726	$182
PLANTING REGIME G - EXISTING BIO RETENTION SWALE PLANTING	3840	$19,350	$3,630	$1,452	$363
PLANTING REGIME H - SCATTERED INDIGENOUS TREE PLANTING	420	$14,700	$9,360	$3,744	$936
PLANTING REGIME I **OPTION A** - SLASHED/MOWN GRASS MAINTENANCE	-	-	$56,985	$56,985	$56,985
PLANTING REGIME I **OPTION B** - SLASHED/MOWN GRASS MAINTENANCE	-	-	$43,008	$43,008	$43,008
COLOURED CONCRETE PATH	-	$1,848,000	-	-	-
TOTAL COSTS					
OPTION A - KEY PRIORITY AREAS FOR REVEGETATION	-	$2,210,748	$130,010	$86,195	$64,288
OPTION B - ASPIRATIONAL REVEGETATION	-	$2,598,958	$172,043	$94,622	$55,912

PROPOSED PLANT SCHEDULE, QUANTITIES AND COSTS
NORTH MERRI OPEN SPACE
WARRNAMBOOL CITY COUNCIL

Title: Proposed Plant Schedule, Quantities and Cost

Client: Warrnambool City Council

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Drawn: AL/SP
Date: 11.06.2025
Project No.: 25-014
Cad File:
Drawing No.: Sheet 6 of 7

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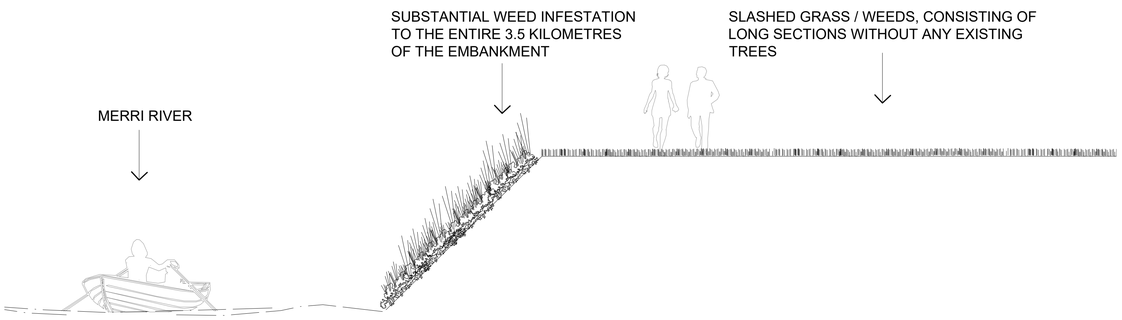
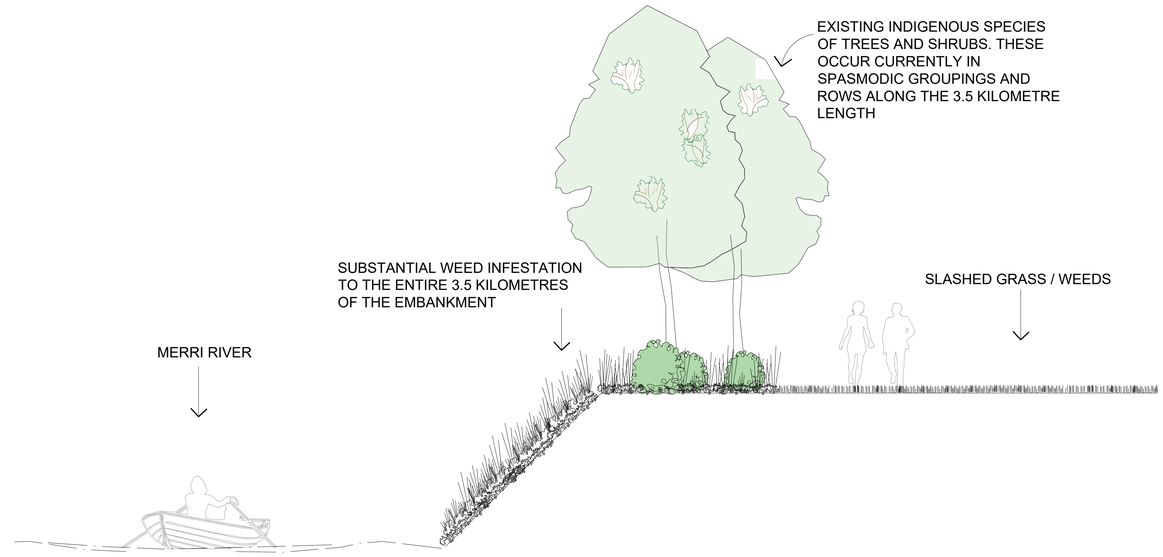
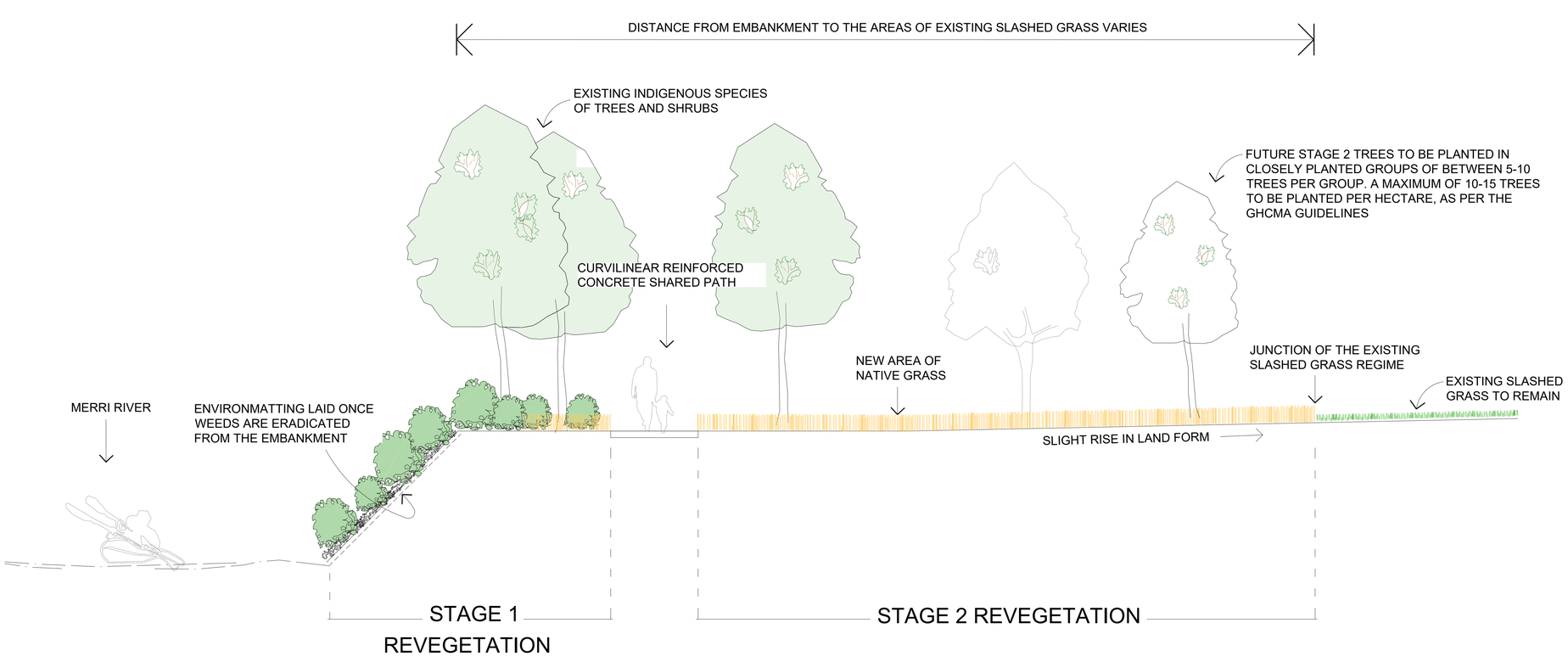


A **EXISTING CONDITIONS OF THE NORTHERN BANK TO THE MERRI RIVER, REGIME 1**
SCALE 1: 50 @ B1 SHEET



B **EXISTING CONDITIONS OF THE NORTHERN BANK TO THE MERRI RIVER, REGIME 2**
SCALE 1: 50 @ B1 SHEET



C **PROPOSED TYPICAL EMBANKMENT AND RIPARIAN STRIP PLANTING, STAGE 1 AND STAGE 2**
SCALE 1: 50 @ B1 SHEET

THE FIRST PRIORITY, STAGE 1, IS TO REVEGETATE THE AREAS UNDERNEATH THE EXISTING INDIGENOUS TREES AND LARGE SHRUBS, AND PLANT LOW SHRUBS AND GROUNDCOVERS, TO INCREASE THE EXISTING HABITAT VALUES WITHIN THE EXISTING TREE GROUPINGS.

THE EXISTING TREES WOULD ASSIST IN RETAINING THE EMBANKMENT IN HEAVY FLOOD EVENTS, THEREFORE HAVING A GREATER CHANCE OF RETAINING PLANTING WITHIN THE TREE COPSES/ROWS.

HABITAT AND BIODIVERSITY IS ENHANCED WITH THE COMBINATION OF EXISTING TREES AND NEW LOW SHRUBS AND GROUNDCOVERS.

STAGE 2 INVOLVES REVEGETATING AREAS OF THE RIPARIAN STRIP FURTHER AWAY FROM THE EMBANKMENT EDGE, AIMING TO SUPPORT THE EXISTING HABITAT AND BIODIVERSITY ESTABLISHED WITHIN STAGE 1, AND PROVIDE ADDITIONAL AMENITY TO THE OPEN SPACE USERS

PROPOSED EMBANKMENT REVEGETATION CROSS SECTIONS
NORTH MERRI OPEN SPACE
WARRNAMBOOL CITY COUNCIL

0 1 2 5M
SCALE 1:50 (B1 SHEET)

Title: Proposed Embankment Revegetation Cross Sections

Client: Warrnambool City Council

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